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EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

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"THE HETEROPTERA OF INDO-CHINA."

By W. L. DISTANT.

Fam. PYRRHOCORIDÆ.

LIST OF SPECIES ALREADY RECEIVED.

<i>Lohita grandis</i> , Gray.	<i>Melamphaus rubrocinctus</i> , Stål.
<i>Physopelta gutta</i> , Burm.	<i>Raxa collaris</i> , gen. n., sp. n.
<i>Physopelta schlanbuschi</i> , Fabr.	<i>Odontopus binotatus</i> , Stål.
<i>Antilocetus coqueberti</i> , Fabr.	<i>Odontopus nigricornis</i> , Stål.
<i>Antilocetus russus</i> , Stål.	<i>Dindymus rubriginosus</i> , Fabr.
<i>Ectatops indignus</i> , Walk.	<i>Dindymus lanius</i> , Stål.
<i>Euscopus rufipes</i> , Stål.	<i>Dysdercus evanescens</i> , Dist.
<i>Euscopus indecorus</i> , Walk.	

Exact localities will be given in a subsequent complete work.

Raxa, gen. nov.

Body oblong, elongate; head with eyes about equal to or very slightly wider than anterior margin of pronotum and in length about equal to breadth at base including eyes; rostrum robust, first joint about or almost reaching anterior coxae; antennæ long, somewhat slender; pronotum with a broad, convex, anterior collar, the anterior margins of which project slightly beyond the lateral angles of the anterior lobe, which is only about half the length of the posterior lobe, the lateral margins moderately laminate, the basal angles broadly subrotundate; scutellum about as long as broad, its base broadly depressed, its apex acute; corium with the lateral margin a little convex, membrane passing the abdominal apex; femora moderately robust; tibiæ almost as long as femora, anterior femora with a prominent spine near apex; basal joint of the posterior tarsi longer than the other two joints together.

Allied to *Melamphaus*, from which it can be at once differentiated by the broad, convex, anterior collar.

Raxa collaris, sp. n.

Head testaceous; pronotum and corium ochraceous; anterior pronotal collar, lateral and posterior margins sometimes testaceous; central area of pronotum narrowing anteriorly; scutellum, clavus, a large central spot to corium, and membrane, excluding apex, black;

body beneath testaceous; sternum with black suffusions, and the abdominal segmental incisures also black; legs black, beneath longitudinally ochraceous; antenna black, basal joint testaceous; rostrum black, the basal joint beneath sometimes testaceous; antennae with the first and second joints longest and subequal in length, third shortest; pronotum with the basal area sparingly coarsely punctate, and the margin between the anterior and posterior lobes also more closely coarsely punctate; basal area of scutellum and corium including clavus coarsely punctate; rostrum reaching the intermediate coxae, first joint about or almost reaching the anterior coxae; anterior femora beneath with a strong subapical spine.

Long, 19-23 mm.

Habitat.—Tonkin and Xieng Khouang, Ban Sai (R. Vitalis de Salvaza).

RHOPALOCERA OF THE UPPER LYS VALLEY, NORTHERN FRANCE.

BY CAPT. E. H. MANN, M.C., AND CAPT. EVELEIGH, R.F.A.

THE following results obtained by two very amateur entomologists during the past few months may possibly prove of interest. The list of captures must, I fear, seem very meagre; but to a certain extent this can be explained by the fact that the weather was not of the best—a very large number of days being very windy—and also to the fact that the best collecting hours usually found both of us employed on our military duties, with the result that expeditions were spasmodic, and, as a rule, late in the afternoon.

No specimens of *Papilio machaon* were observed until August, although several areas of reedy, marshy country were watched. During the first week of August two were taken, followed by several more the succeeding week. Wheat and clover fields situated on high ground seemed the favourite settling-place, though two were observed settling on the warm stones of a railway-track. *Iphiclides podalirius* was not seen, nor has it ever been seen by M. de Wailly, a local entomologist.

I would like to say here that comparison with M. de Wailly's cabinet, the result of forty years' collection, proved interesting and instructive, and the information obtained from him as to the likely places for different species assisted us to a very large extent.

Pieris brassicae and *P. rapae* appeared in their usual numbers. *Euchloe cardamines* were plentiful up to the end of June, but their disappearance was practically instantaneous. *Leptosia sinapis* was not observed, and as only one specimen figures in M. de Wailly's cabinet it is presumably infrequent in this locality.

One specimen of *Colias hyale* was taken early in June after a long chase. During August they were observed in large

numbers, and could easily be taken when settled on clover or lucerne fields, though a long run was always experienced if the insect had been alarmed.

The appearance of *Gonepteryx rhamni* was normal, several good specimens being taken.

Brenthis euphrosyne were taken on the borders of woods, but were not at all frequent.

One specimen of *Isoria lithonia* was observed, but effected its escape, as no net was to hand. M. de Wailly has one good specimen of this species, but states that it is uncommon.

A large colony of *Dryas phiphia* established itself in a glade in a wood. Ab. *valesina* appeared in this colony with some frequency. The ground-colour of some of these specimens was of a very much greener lustre than the normal, so much, in fact, that a sub-variation of *valesina* was suspected. Any further information concerning this suspicion would be much appreciated.

Argynnis cydippe and *A. aglaja* were not observed at all—an absence which would seem rather remarkable in a locality so well suited to these species.

The *Vanessa* group were plentiful, all species being taken with the exception of *Eur Vanessa antiopa*, of which M. de Wailly has only seen two specimens in forty years.

Zugonnia polychloros was very much more plentiful than in the British Isles, being observed in comparative frequency. Its favourite settling-place appeared to be the barks of the darker-coloured trees, its sombre underside rendering it very inconspicuous when settled.

Aglais urticae were present in their usual hordes. M. de Wailly has a very interesting specimen of ab. *ichnusoides* in his cabinet, taken some years ago.

Pyrameis atlanta were scarce during the earlier months, but became very much more common during the second half of September.

Limenitis sibylla was observed and taken. Several specimens of abnormal size are reported in a large wood some miles distant.

Two specimens of *Apatura iris* were observed, and one was taken. This pleasing capture was effected on a very windy day, the insect being driven down from the tree-tops and settling on some lower branches.

Epinephele jurtina and *Cœonympha pamphilus* were of great frequency.

Pararge egeria and *P. megæra* were taken, the latter species being present in numbers that almost rivalled the commoner species of *Pieris*. The specimens had, however, to be carefully selected, as the fighting tendencies of this species caused the vast majority to be badly damaged.

Thecla w-album and *Zephyrus quercus* were the only two

representatives of the *Theela* group to be taken. The lack of a long-handled net was badly felt when dealing with this genus, although the *w. album* were present in abnormal quantity and at low elevations.

Chrysophaenus phleas were in plenty, being found most plentifully in standing wheat and oat-fields.

Polyommatus icarus, *Celastrina armonius* and *Cupido minimus* represented the *Lycena* group, the first in great numbers, but the last two named were uncommon, only one specimen of each being obtained.

Hesperia naevia, *Adonis lara (thaumas)* and *Augiaades sylvanus* represented that interesting family the *Hesperiidae*, being frequent in all lucerne, clover and wheat-fields.

It is hardly to be doubted that more experienced entomologists, with more time at their disposal than we had, would have succeeded in deriving considerable information as to the differences of habit and frequency of Continental Rhopalocera of Northern France from our own. Any information that we can give will be gladly put at the disposal of any inquirers.

1st Army Artillery School,
B.E.F.

ORTHOPTERA, ODONATA AND NEUROPTERA FROM SALONICA.

BY W. J. LUCAS, B.A., F.E.S.

In vol. xlix (1916) of the 'Entomologist,' p. 248, I placed on record a few Neuroptera and Odonata sent me by Mr. P. J. Barraud, F.E.S., from the Salonica front. I have since received three other small consignments made by the same entomologist in the same interesting district. They are as follows:

ORTHOPTERA.

Labidura riparia, Fall.—One male of the large earwig, which, though now British, is, it is to be feared, disappearing from its one known locality on the Hampshire coast. The insect sent was taken at Salt Lake, near Naresh, Salonica-Janes Road, on August 4th, 1918. It is a dark example, but the colour may be partly due to drying, though one would think it could never have had the dirty-white tint of British examples.

Forficula auricularia, Linn., var. *conspicua*.—One teneral male (1917, but otherwise undated), apparently having but recently become an imago. One male, May 8th, 1917, and one female, May 14th, 1917, from Saraeli, fairly common at an elevation of 1000 ft. They were also found in winter at Basanli hibernating in a rotten cherry-log. Four males and two females from Paprat, common at an elevation of 2200 ft., in May and June, 1918. These ear-

wigs are in general dark insects, even the callipers being fairly so; the legs, however, are pale russet. The lateral margins of the pronotum are pale, the elytra and wing-tips are large, and the latter are nearly white with a dark margin. This gives the insect a distinctive and conspicuous appearance, and suggests the varietal name *conspicua*, which I have given it. This white spot is often indicated in British examples, but in the present specimens it is very strongly developed. All the males sent have "high" callipers, the longest measuring 9 mm. from the tip to the outer shoulder at the base. Whether "low" males were present I cannot say.

**Empusa fasciata*, Brullé.—One male imago, Saracli, June 4th, 1917.

Gryllotalpa gryllotalpa, Linn.—One female imago, Kopriva, Struma Valley. It was common at low elevations in April, May and June, 1918.

ODONATA (= PARANEUROPTERA).

Sympetrum striolatum, Charp.—One female, Saracli, 2000 ft., very common, June 6th, 1917. One somewhat teneral female, Paprat, June 12th, 1918.

S. vulgatum, Linn.—Two females, somewhat teneral, near Paprat, June 15th, 1918.

Orthetrum cærulescens, Fabr.—Nine males and one female, near Paprat, June 15th, 1918. The female is very teneral; of the males five are mature and powdered with blue; the other three have no blue colouring and are more or less teneral. In connection with some of these insects, Mr. Barraud remarks: "They take up rather a curious position at rest when watching for prey—usually on the highest point of a dead flower-stem or stick. The wings are held downwards and forwards, while the insect always faces away from the sun. By moving slowly I was on one occasion able to approach my face to within about one foot of the insect and could watch every movement. I judged that it was able to see fast-moving objects at a distance of 3 ft., as, when flies went by at about that distance, the dragonfly moved its head from side to side as if watching them. It appeared also to exercise some choice as to the kind of fly preyed upon. No notice was taken of some kinds, but a quick dash was made after others. What these were I was unable to determine, the movements being so rapid. The insect returned again and again to the same post of vantage after an excursion." Mr. Barraud may have intended this note to refer to *S. striolatum*, for he apparently took both for the same species.†

**Onychogomphus uncatus*. Charp.—One male, near Paprat, at an altitude of 2000 ft., June 15th, 1918.

* The species marked with a star are not British.

† *S. striolatum* has similar habits in England.

Cordulegaster annulatus, Litr.—One female, from Paprat, Krusha, Balkan Hills, about 2500 ft., May 29th, 1918.

Calopteryx splendens, Har., var. *xanthostoma*, Charp.—A male, June 10th, 1918, and a female, June 12th, 1918, Paprat, 2000 ft.

**Lestes barbarus*, Fabr.—One female, near Paprat, 2000 ft., June 13th, 1918.

Pyrhosoma nymphula, Sulz.—One male, Paprat, June 6th, 1918.

Ischnura rutilio, Charp.—A male and a female, Paprat, Krusha, Balkan Hills, about 2500 ft., June 6th, 1918.

Platycnemis pennipes, Pall.—Eight—four males, Paprat, June 6th, 1918; one male, Paprat, Krusha, Balkan Hills 2800 ft., June 10th, 1918; one male and two females, Paprat, June 12th, 1918. Some of those taken on June 6th are not quite mature, one female being in fact very teneral. Although some are discoloured, they appear to belong chiefly to the whitish form.

**Agrion ornatum*, Heyer.—One male, Paprat, June 12th, 1918.

NEUROPTERA.

**Firmitaco tetragrammica*, Fabr.—An ant-lion, one, Saraeli, June 4th, 1917.

**Myrmecolax trigrammus*, Pall.—An ant-lion, one, Paprat, July 1st, 1918.

**Pulparet libeluloides*, Linn.—A male and a female of this fine ant-lion, Salt Lake, near Naresh, Salonica-Janes Road, August 4th, 1918.

**Nemoptera sinuata*, Oliv.—Two, Saraeli, 2000 ft., common, June 6th, 1917.

Damylus eryops, Linn.—Two, Paprat, 2200 ft., July 1st, 1918.

Kingston-on-Thames,
December, 1918.

HEMIPTERA-HOMOPTERA TAKEN IN THE NEW FOREST.

By G. T. LYLE, F.E.S.

Local records of Hemiptera being so few, I have been urged to publish the following list, in spite of its very incomplete character. The species mentioned have been met with during the past nine years, mostly while collecting insects of other orders, and the number recorded could probably be doubled in a single season by serious work. I am greatly indebted to Mr. James Edwards and Mr. E. A. Butler, B.A., B.Sc., for most kindly and willingly naming those specimens of which I was uncertain.

Cicadetta, Am.

Montana, Scop. Very local. I have nothing to add to my notes already published in the 'Entomologist' (xlivi, p. 1, xliv, p. 332, and xlvi, p. 301), excepting that Mr. Charles Gulliver tells me that in 1916 he discovered a second breeding-place of the species, some two miles distant from that described by me.

Centrotus, Fab.

Cornutus, Linn. Fairly common in May; the nymph may be beaten in September from various trees.

Issus, Fab.

Coleoptratus, Geoffr. More plentiful in the old woods than in the more recent enclosures, June to September. The insect usually assumes the perfect state in the early part of the former month.

Cixius, Latr.

Pilosus, Ol. Very common in May. Var. *infumatus* occurs plentifully, and I have also several times taken var. *albicinctus*.

Nervosus, Linn. Common, though not so plentiful as the last (August and September).

Brachycranus, Fieb. Taken occasionally in late autumn.

Liburnia, Stal.

Pelucida, Fab. Common.

Fairmairei, Perris. One on September 18th, 1910.

Strioma, Fieb.

Pteridis, Boh. Very abundant.

Triecphora, Am. et Serv.

Vulnerata, Illeg. Somewhat scarce and local; a few specimens may usually be beaten in May from hawthorn bushes in Stubby Copse. I am told that the species was formerly much more plentiful.

Aphrophora, Germ.

Alni. Fall Abundant on various trees and shrubs, particularly *Myrica gale*.

Salicis, De G. Common, though far less so than the last.

Philænus, Stal.

Spumarius, Linn. This very abundant insect does not appear to vary so much as in other districts. On August 31st, 1910, I swept a very pretty form from blossoming ling. In this specimen the head and prothorax are pink, the elytra being of the same colour with two black blotches on the costa. Mr. E. A. Butler, who has seen the insect, tells me the form is new to him.

Lineatus, Linn. Very plentiful in the bogs.

Ledra, Fab.

Aurita, Linn. Usually, though not always, on oak; the imago is fairly common in July, August and September, while the nymph I have found in every month from April to October, with the exception of July. The nymphs are quite small at the end of August, but attain a length of 8 mm. or so before going into hibernation.

Ulapa, Fall.

Reticulata, Fab. Very abundant.

Macropsis, Lewis.

Lanio, Linn. Common on oak in September and October.

Bythoscopus, Germ.

Rufinculus, Fieb. Usually plentiful on birch; was particularly common in September, 1910.

Flavicollis, Linn. Very common on birch in May.

Pediopsis, Burm.

Rubi. One on August 24th, 1910; the specimen was identified by Mr. E. A. Butler.

Idiocerus, Lewis.

Lituratus, Fall. Common on sallows in September and October.

Tibialis, Fieb. I took an example of this rare species from honeysuckle on March 23rd, 1913.

Confusus, Flor. Very common on sallow August to November.

Evaenanthus, Lep. et Sev.

Interrupitus, Linn. Appears to be somewhat scarce.

Acuminatus, Fab. More common than the last. I have swept several from bilberry growing under trees in August.

Tettigonia, Geoff.

Venustus, Linn. Not common.

Eupelix, Germ.

Cuspulata, Fab. Occasionally swept from low plants in Stubby Copse, May.

Atthysanus, Burm.

Griseocera, Lett. Swept from rough grass, heather, etc., in May.

Oisadetus, Kbn. Common in the bogs.

Suljugendus, Kb. In great numbers on grass (*Spartina stricta*), growing on muddy shore of Solent at Park and also near the mouth of the Beaulieu river. First taken in Britain

by Mr. Butler, who discovered it on the opposite shore of the Solent and also found it plentifully at Lymington (E.M.M. xlvi, p. 13). In 1898 very little of the grass was growing on the Solent mud flats, a few isolated clumps only shewing, but now the whole of the flats have the appearance of verdant fields. Longshoremen have told me that the plant was introduced during the hard winter of 1895, when roots were transported from Southampton water frozen in ice floes which grounded on the flats. I was myself a witness to its marvellously rapid spread.

Deltoccephalus, Burm.

Socialis, Flar. Very plentiful on heather.

Allygus, Fieb.

Mixtus, Fab. Abundant on oak and occasionally taken on birch, July to October.

Thamnotettix, Lett.

Dilutior, Kbm. On oak ; also swept from bracken.

Subfuscula, Fall. Fairly plentiful on oak in May. On blossom of wood spurge, April 24th, 1912.

Cruentata, Panz. Common in the bogs and in damp places on heaths. I have very many times swept it from heather and beaten it from young birch trees.

Spennidula, Fab. Common.

Limuotettix, Sahl.

Striola, Fall. Usually to be found in damp places on heaths.

Cicadula, Fieb.

Septemnotata, Fall. Plentiful amongst herbage in ditches.

Fascifrons, Stal. Mr. Butler so named a female which I took on broom, September 18th, 1910.

Sexnotata, Fall. Very common.

Alebra, Fieb.

Albostriella, Fall. This handsome and variable insect is common on oak and beech.

Dicranenra, Hardy.

Mollicula, Boh. A few on hazel in a lane at Brockenhurst.

Kybos, Fieb.

Smaragdula, Fall. Common on sallow and birch.

Chlorita, Fieb.

Flavescens, Fab. Beaten from holly in November.

Viridula, Fall. Common ; passes the winter in thick conifers, holly or ivy.

Eupteryx, Curt.

Vittatus, Linn. Common on ramunculus in damp woods near streams.

Strachydearum, Hardy. Often swept from wood sage.

Auratus, Liv. On low plants; once on garden parsnip.

Atropunctata, Goeze. On low plants in damp places.

Germari, Lett. On *Pinus sylvestris*; also common on Douglas fir in the winter.

Pnichellus, Fall. Common, usually on oak, but occasionally on sallow.

Couetina, Germ. Also common on oak. I have noticed that this species is particularly liable to the attacks of a parasite (*Tionotopus* sp.?), the brownish, globular larvae of which is firmly attached to the abdomen of its host. *E. pulchellus* and *E. Germari* are also preyed upon by the parasite. Unfortunately I have never succeeded in rearing it.

Typhlocyba, Germ.

Jacunda, H. S. On alder.

Serpunctata, Fall. Common on sallow and occasionally on birch.

Ulmii, Linn. Very abundant in hedges near elm trees at Brockenhurst. In the forest itself elm does not grow.

Auroritata, Dongi. Swarms on bramble in October.

Douglasii, Edw. Common.

Gratiosa, Boh. One beaten from beech, October 30th, 1910.

Quercus, Fab. Common on oak.

Geometrica, Schr. Fairly abundant on alder.

Carri, Ed. Mr. J. Edwards has so named a specimen I took on September 9th, 1910.

Zugina, Fieb.

Alucta, Dahl. Fairly common.

Flammeigera, Geoff. Beaten from yew and Douglas fir in winter.

Tiliae, Fall. I have two specimens named by Mr. Edwards, one from oak, August 31st, 1910, the other from Douglas fir, December 17th, 1910.

Purpurea, Boh. From oak and holly in November.

Neglecta. Common on Douglas fir in winter. I have two which Mr. Edwards names var. *rubrinervis*.

Rosea. Four, so named by Mr. Edwards with a "?" were beaten from conifers in the winter.

PSYLLINA.

Aphalaro, Forst.

Calthae, Linn. Several beaten from Douglas fir in December and January.

Psyllopsis, F. Low.

Fraxini, Linn. Plentiful on ash in September.

Psylla, F. Low.

Pruni, Scop. I have a specimen taken on Douglas fir on January 29th, 1911.

Cratægi, Schr. Not common. It would seem that this species usually passes the winter in furze-bushes, and I have beaten it from *Pinus sylvestris* in February.

Rhamnicola, Scott. Fairly plentiful in conifers in winter.

Melanoneura, Forst. Countless numbers may be beaten from Douglas fir and other thick conifers in the winter. I have also taken it on oak in late August, hawthorn and sallow in early October, and found it very commonly on hawthorn and blossoming sallow in March.

Ferruginea, Edw. Common on *Pinus sylvestris* in January.

Betulae, Linn. On oak and birch in September and October.

Nigrita, Zett. Mr. Edwards has detected one specimen among a number of *P. melanoneura* beaten from sallow on March 3rd, 1912.

Peregrina, Forst. Several on hawthorn in August, September and October.

Mali, Schmddbg. On crab apple in October.

Forsteri, Flor. Plentiful on alder.

Arytaena, Scott.

Genistæ, Latr. Common on broom.

Trioza, Forst.

Albiventris, Forst. Plentiful on conifers in the winter, though not nearly so abundant as the next.

Remota, Forst. Exceedingly common on Douglas fir, etc. I have also beaten it from holly in November and December.

THE NOCTUIDÆ OF GREAT BRITAIN AS ARRANGED
IN THE GENERAL COLLECTION AT THE NATURAL
HISTORY MUSEUM.

BY RICHARD SOUTH.

(Continued from Vol. LI, p. 272.)

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5147. EUBLEMMA OSTRINA, Hübn.

Thalpochares ostrina, E.S.L., p. 10; T. iv, p. 8; M.B.I., ii,
p. 55.

Eublemma ostrina, M., p. 168.

5181. EUBLEMMA PARVA, Hüb.
Thaipochares parva, E.S.L., p. 10; T., iv, p. 10; M.B.I., ii,
 p. 56.
Eublemma parva, M., p. 168.
5885. EUBLEMMA NOCTUALIS, Hüb.
Eublemma paula, M., p. 169.
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5807. LATHACODIA FASCIANA, L.
Erastria fasciana, E.S.L., p. 10; M., p. 164; T., iv, p. 5.
Hapalitis fasciana, M.B.I., ii, p. 57.
5859. EUSTROTTIA UNCULA, Clerck.
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DIPTERA IN NESTS OF CRABRO.

BY EUSTACE F. WALLIS.

Whilst sawing up a large, rotten elm trunk, I noticed a number of old burrows of two or more species of *Crabro*, and was much interested in the great variety of species of Diptera with which they were provisioned.

I know very little about the Hymenoptera, but was under the impression that each species of *Crabro* was supposed to restrict itself to a single species—or at least genus—of Diptera, but in most of the cells that I examined there was more than one genus and always more than one species represented.

Many of the cells were barren, no eggs having been laid in them or the eggs having failed to develop.

The burrows were of two sizes, one about 8 mm. in diameter, and the other about 5 mm.

At first I scraped out the contents of a number of cells without any intention of further examination, and, as a strong wind was blowing at the time, the flies were lost; but when I noticed a brightly coloured *Sarcophaga* (probably *S. flavipes*)

amongst a number of smaller black flies, I thought a more careful examination might be of interest.

I collected the contents of eight cells, and as far as I could determine from the very fragile and intermixed remains, the species contained were the following:

Cell 1: 3 *Syrphus luniger*, 3 *S. balteatus*.

Cell 2: 3 *S. ribesii*, 1 *S. luniger*, 1 *Lioaster metallina*.

Cell 3: 5 *Syrphus luniger*, 1 *S. balteatus*.

Cell 4: 2 *Nemopoda cylindrica*, 1 *Dolichopus* (a rather large species). 3 *Beris vallata*, 3 *B. chalybeata*, 3 species of Anthomyidae (1 *Ophyra leucostoma* and the others either *Hydrotea* or *Hyedotesia*), 1 *Chyliza* (probably *anulipes*), 1 *Microchrysa polita*.

Cell 5: 8 *Chyliza*, 1 *Ophyra leucostoma*, 1 species *Dolicopodidae* (grey, medium size).

Cell 6: 1 *Hyedotesia*, 1 *Microchrysa polita*, 9 *Chyliza*, 1 *Neuriogoma* (?). 1 *Phorbia*, 1 *Medeterus* (the smallest specimen found).

Cell 7: 3 *S. ribesii*, 4 *Platychirus* (?) *scutatus*, 1 *P. albimanus*, 2 *Melanostoma ambiguum*.

Cell 8: The flies partly demolished, the abdomen in every case being missing. The remains appeared mostly to be *Chyliza*.

The *Syrphidae* in all cases were in the larger burrows and the smaller flies usually in the smaller, but in one instance I found two cells containing small flies in a large burrow in front of a cell containing *Syrphidae*.

The large burrows seem to have been drilled straight into the trunk for an inch or two, then turning to follow the grain of the wood. In each case there were three or four branches from the main gallery but only one cell in each branch.

The smaller burrows had two or more cells in the same gallery but there seemed to be no short side branches.

Newton, near Kettering.

A SEASON'S COLLECTING IN THE ALPES-MARITIMES.

BY CHARLES E. MORRIS.

St. Etienne-de-Tinée, in the Alpes-Maritimes, is situated 86 kilometres N.E. of Nice, near the Italian frontier, at an altitude of 3740 feet. I arrived there with my friend Mr. E. Tucker on June 1st last year, and we remained until October 9th. We much enjoyed our long stay in this sub-alpine resort. The Hotel de Rabuons was fairly comfortable and clean, the food good, well cooked and served, and plenty of it. The weather was magnificent, the flora superb, and, most important, the butterflies were also numerous, and in many cases very interesting to us, as they showed, especially in the Melitæids, considerable variation.

The spectacle of thousands of gentians and pansies, studded

with *Anemone alpina* and *A. narcissiflora*, on an immense velvety-green lawn-like expanse was an unforgettable sight, with ravines of *Lilium croceum*, spiraeas, purple campanulas, and a host of brilliant leguminous plants— a gorgeous blaze of colour. The lovely blue clematis hung its tresses on the rocks bright with *Aquilegia alpina*, and the air was redolent with the lily-of-the-valley here and there. In some of the side valleys *Thalictrum* and *Dianthus*, linarias, saxifrages, and a host of rock plants and showy labiates interested and attracted the eye at every step, and all the fields were a sheet of tender pink and mauve bestarred with marguerites. St. Etienne has a splendid water-supply from the chain of lakes in the high peaks of Rabuons and Ténibres, and their cascades descending to the valley are all under control, and can be shut off or turned on at will for irrigation purposes. It is for this reason that considerable portions of the lower slopes are always green and floriferous despite the great heat and drought of the southern summers, which burn up the rest of mountain and valley. There is no *Dorycnium*, but plenty of lavender of course.

Collecting is hard work on the long excursions. Often I was up at 3 a.m., and, after coffee, started in the darkness at four for a six hours' walk to reach the ground, and then sometimes when one had arrived the sunshine went off. The Col de Gialorgues, 2529 m., is a five-hours' run, the Lac de Vens ditto, as also the Forêt de la Serrière. At the Lac de Rabuons, about the same distance, there is a hut, and one can stay the night, but I did not get as far as the lake as the day I set out for it was one of the few broken days experienced. And Oh! the steep, rough mountain paths, or *no* paths. What it cost in shoe-leather, though heavily armoured with nails, I will not here recount. Seven pairs of boots did not carry me through without many repairs!

I subjoin an annotated list of the various Lepidoptera that we either took or observed during our many hunts in the district.

HESPERIIDÆ. *Carcharodus bartoniæ* Rbr., males plentiful at mud; females very scarce on flowers; a second emergence, very small in numbers and size, at end of August and beginning of September. Larvae, nearly full fed, feeding on mallows when we left. *C. aleucæ* var. *australis* not nearly so common. Second emergence, September and October. *C. larateræ*, at mud, but not very common; mostly flying on hot rocks in steep, inaccessible places. ? Second emergence; one male taken in mid-September.

Hesperiæ. The species captured appear to be as follows, so far as I can determine them at present with the limited means at my disposal: *H. carthami* very plentiful on mountain roads at mules' droppings, wet mud, etc.; females scarcer, but with dark hind wings, and some of both sexes heavily spotted white.

Undersides, variable shades of ochre grey; second emergence rather smaller than the first. *H. armoricanus*, large; *H. alveus*, many large forms with variable undersides; *H. bellieri*, large; *H. foulquieri*, small; *H. fritillum (cirsii)*, small; *H. serratulae*, two forms—a larger and a smaller; females of both common at mules' dung, and mud; but I did not come across var. *cæca*, or var. *tarasoides*, unless this is the large form. *H. carlineae*, large; *H. onopordi*: the form here is larger than that of the Cannes district; *H. cacaliae* very rare—at least I saw and took but one fresh female at mud on the Route de Vens; *H. malvoidea*, at mules' dung, flowers, and moisture; a few undersides variable in shade.

Pyrgus sao very plentiful, with a fairly long emergence, ? two broods overlapping; rich in colour, but on the underside not so varied as in some localities. I took one example of what I think is a banded form of this species, or *P. proto*, in the valley of the Ardon. I did not find any *Phlomis* growing in this district.

Nisoniades tages over when we arrived. I did not notice a second emergence.*

Adopœa lineola very common with *A. flava*; *Thymelicus acteon* not observed, perhaps overlooked; *Augiades sylvanus* not very common; *A. comma* plentiful, but not abundant, ab. *flava*, or var. *catena* ?.

LYCÆNIDÆ.—*Chrysophanus virgaureæ* common; one beautiful male with the upper-side right wing silver (as in *phœas* ab. *alba*) to orange copper; females plentiful, showing French-white spots on the upper-side of the hind wings corresponding to the spots in *phœas cœruleo-punctata*; *C. hippothoe* var. *curybia* about normal size; one male, underside right wing *subtus-radiata* (*confusa*); left ab. *cæca*; one female ab. *nigra*; another radiated on the upper-side; another flawed bright copper on the fore-wings; *C. dorilis* var. *subalpina* intermediate to the black form. I found a locality where it had been abundant, but all *passé* when I got there; ab. *purpureo-punctata* and ab. *brunnea* also occurred in the valley. *C. phœas*, gen. vern., nearly over; gen. *est. suffusa* and *eleus* with type; gen. *auct.*, October, a few when we left quite fresh out. There had been no cold weather up to then. At Le Cannet it was still coming out on November 10th.

Lycæna alcion very local, and not so fine as at Beauvezier, but attached to the same species of gentian, *G. cruciata*. So far as I know *G. pumicinanthe* does not grow in the Alpes-Maritimes. Var. *monticola* I did not come across. At Beauvezier in 1914 it favoured one single locality. *L. arion* varied in size; in one locality it was very fine and large; var. *obscura* and intermediates. One female with very slight spotting on the upper-

* There was a second emergence of everything except clover and other leguminous plant-feeders, which were all very scarce on account of the unprecedented drought.

side. A fairly long emergence : not before June 28th. *L. amanda*, a few : only one female ; not common in any locality visited. A long emergence, as I saw a fresh male on August 5th at lavender, and worn individuals were observed on July 10th.

Cupido minimus, in two gens. Very scarce ; a few taken for comparison. *C. sebris*, scarce, also, in both emergences.

Nomia leucocylarus, almost over by June, and no second emergence noted. *N. semiargus*, abundant.

Hesutina damon abundant with females of two forms, ash colour and golden ochre, undersides bright *café-au-lait* ; two with upper-sides almost as dark as *A. cunedou*. The males vary, of course, as to depth of border and brilliancy of blue tinge. *H. admotus* var. *rippertii* not observed, but perhaps I may find it in the valley of Roya, where the soil is more distinctly calcareous.

Polyommatus icarus never very common, in fact sparse, but of curious tints—new blues to me. I have only three examples, each different, and the most brilliant suggests in colour a hybrid *icarus* × *escheri*, *icarus* being parent progenital. A few ab. *celina*, Obthr. Some females of glistening blue, with rich crimson-mauve reflection over a central area. One male, a light blue, shot with the colour of *P. eros*, or perhaps *N. cylarus* better describes it. I have never seen a shade like it except in a pale greyish-blue *cylarus* we took at Thorame Haute, Basses Alpes, in 1914. Females, varied shades of blue, but not common, also "all brown." *P. eros* not common ; very bright ; females very difficult to find. *P. hylas*, gen. vern., males worn in June, but rather dusky (= ab. *nigropunctata*), and neuration strongly marked. Gen. *aest.*, larger, clearer blue, and sometimes a slight tinge of lilac. Female brown, more or less bordered orange spots. I saw nothing approaching ab. *metallica*. *P. escheri*, males swarming at mud, the confusion making it impossible to pick out anything from the crowd : varied in size and brilliance of tone ; none very fine. Females very scarce at lavender, etc. ; some with a little blue at the base, but not very brilliant orange spots on the upper side (ab. *punctulata*, ♂). *P. meleager* not very common ; both forms of the female very scarce. I took a fresh male as late as September 6th.

Tartites cordoni emergence began very white, and here and there only. First observed July 6th. It became abundant in certain localities at the end of July, and through August into September, when I took a fresh male on the 14th. There are all the usual forms of the male, a few with white fringes, ocellated borders with pale and dark. Females very ordinary, a single one showing a tendency to ab. *semisyngrapha* ; very few with bright orange spots, although most show dull white and orange-brown cells in the hind-wing borders on the upper-side. Male, orange-spotted, ab. *amantia*, Wh., of course. The first pale forms

are probably the mountain form of *aragonensis*, Verity (= *meridionalis*, Tutt), but they are quite different to our spring form here on the coast, and inland as far as Grasse, Gorge du Loup, etc., which, though pale, is far larger and very distinctly ocellated both above (border) and beneath, all spots being distinct and black; whilst on the underside of these alpine forms the spots are small and the border of orange very suppressed. Besides, our spring forms are of a peculiar silver-grey, with often a metallic greenish-brown reflection. *A. bellargus* common, males of various shades; females, *semiceronus* to *ceronus*, but not common. Two emergences, gen. *aest.*, smaller and more distinctly chequered fringes and neuration; ab. *punctata* not very common. *A. thersites* (or *P. icarus* ab. *icarinus*?): I took only three examples, two of the second or third gen. in September.

Latiorina orbitulus, a few seen at wet dung at the entrance to St. Dalmas. I did not come across it again. It appeared to be the ab. *aquilonia* form more or less pronounced.

Aricia medon, males plentiful, females very rare. One male, ab. *allous*, entirely brown, and intermediate forms. Two emergences, or three; a male taken October 5th. *A. donzelii*: I was surprised not to find this insect where there was such a wealth of geranium. *A. eumedon*, the first Lycaenid taken fresh: in many meadows but never common; females very scarce, and hard to get in good order. In August I saw it at the Col de Gialorgues also.

Scolitandes baton, one or two worn males in the first week of June; not seen again.

Plebeius aegon, common in certain localities, but not abundant as in the Basses-Alps. *P. argus* (*argyrophuomon*, Auct.), or a large form of *aegon*, one example only taken; it may have been a bad year for the Plebeiids. [This blue probably is the var. *ligurica* lately separated by M. Oberthür and Dr. Chapman in the *argus* group.—H. R.-B.] *Argus* was not very common; second emergence, with very dark females, both sexes with square-formed wings.

Celastrina argiolus, a few seen at bramble-blossom.

Callophrys rubi, over in June.

Zephyrus betulae, very large, but rather worn as late as September 14th at the large flowering umbelliferous plants; *Z. quercus*, one very worn at ash, September 14th. Oak is very scarce at St. Etienne.

Thecla spini, common but local at sedum; *T. acaciæ*, also at sedum, and very local.

LEMONIIDÆ.—*Nemeobius lucina*, very common in May, but *passé* in June; no second emergence noted. Dark forms exist here.

PAPILIONIDÆ.—*Iphiclides podalirius*: I suspect two broods, but did not work them. Larvæ in gardens on pear-shoots, full fed at the beginning of September.

Papilio alexander, five or six taken in hot ravines at St. Etienne, but I could find neither *Sesile montanum*, nor the larvae on any umbelliferous plant in August and September. I fancy the drought drove the females a long way. *P. machaon*, common, not worked.

Parnassius apollo, very abundant. All June and beginning of July the males and females were so stained rust-red as to be useless. This is from the pollen of liliaceous plants—*L. croceum*, *L. martagon*—and perhaps other flowers visited by the insects. M. Lameere, the Belgian Professor of Zoology, is my authority for this explanation of the rusty red discoloration of the underside of numbers of *apollo* in this region. Also, at Valdehlore, M. Dumont in 1916 assured me it was a variety, and I then thought it was merely a malady, or fungus, or from the soil or rock amongst which the larva pupated. Has the microscope solved the mystery and confirmed M. Lameere's theory? In mid-July we found two larvae (? *apollo*), yellow-spotted, and smaller than the orange-spotted larva; these we kept on sedum. They spun up and duly emerged in August, and are about the size of *delius*, but superficially like *apollo* only whiter. I am not sure if they are not distinct. *P. delius*, a few at wet saxifrages, but the butterfly had dispersed, as later in the day a good number were seen returning to the water from the mountain slopes.

(To be continued.)

NOTES AND OBSERVATIONS.

INVASION OF THE RIVIERA BY PYRAMEIS CARDUI.—We had an extraordinary visitation, or invasion, of *Pyrameis cardui* in 1918 from May 5th to May 8th. It began on the 5th, and arrived at Antibes, Cannes, etc., passing west along to Hyères. There must have been millions. I estimated 500,000 on my walk to Ranquin on the 7th, and peasants at Mouans-Sartoux (reliable) told me that there they passed over at a low altitude in a vast cloud, and that the hum of flight of their wings was extraordinary. My friend, M. Mannart, witnessed this at Antibes; unfortunately I did not see the cloud of them, but the rear-guards were everywhere in hundreds of thousands. I noticed one on a patch of mud, with about a hundred others, no larger than a small male *Brachia levana*, but I could not take it owing to the confusion. They were like autumn leaves all that day, and I had to give up collecting. I found many were almost fresh. They were accompanied by numerous worn *Plusia gamma*. Mr. Harold Powell wrote me that they arrived at Hyères, and were then very worn, and that the resulting larvae, finding insufficient food, took to the artichoke fields, which they devastated entirely. At St. Etienne-de-Tinée I took larva on burdock, but all were ichneumoned except two, and imagines were sparse during the autumn and late summer.

C. E. MORRIS Villa Chatelet, Le Cannet, Alpes-Maritimes, November 12th, 1918.

[The accompaniment of *P. cardui* by *P. gamma* has frequently been observed in this country in years when abnormal migrations of the butterfly have taken place. I remember well that in the wet summer of 1879 they flew together in swarms on the Downs at Hunstanton, Norfolk.—H. R.-B.]

HIBERNATING STAGE OF THYMICUS ACTÆON.—In a foot-note to my remarks on the hibernating stage of *T. acteon* ('Entomologist,' vol. li, p. 247), I mentioned Mr. Frohawk as the authority who could clear up the ambiguity. He has very kindly drawn my attention to the life-history of the species published by him in 'The Field' some time in 1915. He says that the ovum hatches on the twenty-third day from laying. Larva at once hibernates, and remains hibernating for eight months without feeding at all. Ova usually hatch toward the end of August.—H. ROWLAND-BROWN; Harrow Weald, December 4th, 1918.

THE LARVAL HABITS OF DIORYCTRIA ABIETELLA.—At the beginning of July last I found a fir-cone in which a larva was evidently feeding. The hole was sealed up about the middle of the month and a fine *D. abietella* ♀ emerged on August 4th. Meyrick says of this species: ". . . in shoots of *Pinus sylvestris*, not causing resinous exudation; 4, 5." Leech, quoting Hofmann, says; "The larva lives in fir-cones in October; it leaves them in November, and spins a cocoon on the surface of the ground, in which it passes the winter, pupating in spring." My single observation does not, of course, invalidate Meyrick's description, as the discrepancy is sufficiently slight to be the result of individual habit and developmental delay. Hofmann's view is evidently incorrect.—H. DOUGLAS SMART, Major, R.A.M.C.; Prisoners of War Hospital, Brocton, Staffs, December 4th, 1918.

NOTE ON LASIOCAMPUS QUERCUS.—With reference to your correspondent Mr. Woolacott's interesting experience with this insect ('Entomologist,' vol. li, p. 259) may I offer a solution? In the ordinary course of Nature the actual commencement of the development of a moth's wings is practically simultaneous with its emergence. Therefore, this insect having been unnaturally liberated, goes to show that the supreme moment had not arrived, and would not have arrived for two days (the time it remained unchanged), when under natural conditions the wings would have commenced to develop on emergence, the insect having then reached the critical moment when both actions (emergence and development) would have taken place together. In regard to the second occurrence, copulation could have easily taken place during the two days, as a moth's body would be in a perfectly developed state practically a week before natural emergence.—H. A. MORRELL; Heathdene, Wordsworth Road, Wallington, Surrey.

SPHINX CONVOLVULI AND CIDARIA MIATA IN SHETLAND.—It may be of interest to record the occurrence in Shetland of two rare moths, viz. *Sphinx convolvuli* and *Cidaria miata*. The former has to my knowledge been seen and specimens obtained several times. The

first specimen was, I believe, captured by Mr. Cousins at Ordale about the year 1885, and again in 1901 one was caught at Halligarth, Baltasound, by Dr. Finzel. In September, 1917, we captured two which were hovering over the honeysuckle in the evening, and two others which had found their way into the greenhouse. I may say that one of these insects, which was chloroformed and pinned down over-night, was seen to be still alive when we opened the box next morning. It is a curious fact that almost all the honeysuckle where the *Convolvulus* Hawk was seen last year has not come out in leaf again and seems to be quite dead. *Cidaria miata*, the first I understand recorded for Shetland, I caught late at night inside my window on September 30th, 1917, and sent along with the *Convolvulus* Hawk Moth to the Edinburgh Museum for identification.—IDA M. FURNISS SAXBY : Halligarth, Baltasound, Shetland.

PARARGE MEGÆRA IN NORTH-WEST MIDDLESEX.—With reference to Mr. Rowland-Brown's note on *Pararge megæra* in North-West Middlesex ('Entomologist,' vol. li, p. 233), I saw several specimens here this year. Looking through the list of "Butterflies observed in this Neighbourhood" by members of the Enfield Natural History Society, I find that all who sent in lists reported this insect as occurring in this district. These lists are all dated since Mr. Sykes' record, but are all prior to the war. I have observed the species myself in small numbers up to 1914, but since that date, having been engaged with other "winged beasts," I have had no opportunity until this last season.—H. M. EDELSTEN; The Elms, Forty Hill, Enfield, Middlesex

POLYGONIA C-ALBUM IN WILTSHIRE.—I have to record the capture here on October 23rd of *Polygonia c-album*, a perfect female specimen. This is the first I have seen in this district.—C. A. SLADEN; Alton Barnes Rectory, Pewsey, Wilts, November 20th, 1918.

CHrysophanus phleas IN LATE OCTOBER.—This butterfly was late here last year. I saw a freshly-emerged specimen on October 24th.

H. M. EDELSTEN; The Elms, Forty Hill, Enfield

LATE OCCURRENCE OF *PYRAMEIS CARDUI*.—In amplification of Mr. Raynor's note on the late appearance of *Pyrameis cardui* at Maldon, which was published in the December issue, it may be remarked that the species, where it occurred at all, exhibited a marked tendency to be late in its appearance this year. Whereas English-born specimens were plentiful here throughout August in 1917, this year I did not see one until September 6th. As regards larvae I did not notice any at the normal time, but on September 6th I found them of all ages feeding freely despite the cold spell we were experiencing at the time. A number of these larvae were kept indoors, and all produced butterflies between October 9th and 20th.

E. W. GARDNER, Major, R.A.F.; Kingsnorth Air Station, Hoo, Rochester, Kent, December 17th, 1918.

SOCIETIES.

DERBYSHIRE ENTOMOLOGICAL SOCIETY.—*Saturday, November 2nd, 1918.*—Dr. W. St. A. St. John, M.R.C.S., L.R.C.P., President, in the chair.—Mr. A. E. W. Morse and the Rev. W. H. Foster Pegg were elected members of the Society.—The meeting was the Annual Exhibition Meeting of the Society, and amongst numerous good exhibits the following may be mentioned: The President, *Abraxas sylvata* and *A. grossulariata*, the latter including a long series of var. *varleyata*, together with series of vars. *lacticolor*, *lutea*, *gloriosa*, etc.—Mr. H. C. Hayward, a splendid exhibit of the Tæniocampids other than *T. stabilis* and *T. pulverulenta*, comprising good series of practically all the varieties mentioned in Tutt's 'Noctuæ,' including vars. *rufescens* and *brunnea* of *T. gracilis* and var. *nigra* of *T. populeti*; also a number of Micros, including the following, now first recorded for Derbyshire: *Pædisca rubiginosana*, *Eupocelia dubitana*, *Dicrorampha politana*, *Adela cuprella*, and *Swammerdamia combinella*.—Mr. A. Simmons, a large drawer containing the whole of the "Skipper" family, comprising about 600 specimens captured by himself, also a very varied series of *Mimas tiliae*, including one-spot and asymmetrical specimens.—Dr. Druitt, series of *Lithosia caniola* from Devon.—Mr. G. Hanson Sale, long bred series of *Mesoleuca albicillata* and *Lasiocampa quercus* var. *callunæ*, the ♀♀ of the latter showing extreme range of coloration, and a series of *Metopsilus (Chærocampa) porcellus* captured this year at pinks in his garden.—Mr. J. Douglas, a number of interesting insects taken this season in Mid-Derbyshire, a good series of all the Leucaniidæ, and a long series of *Caradrina exigua* taken by himself in 1906.—The President kindly entertained the members and several visitors to tea.—JAMES DOUGLAS, Hon. Sec.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The opening meeting of the Session was devoted to exhibits, which were as follows: Mr. F. N. Pierce, a very dark example of *Tephrosia biundularia*, var. *declamerensis* from Abbott's Moss and a large number of Micro-lepidoptera.—Mr. B. Wilding, *Aglais urticæ* (including a banded variety), *Argynnis aglaja*, *Brenthis euphrosyne*, *B. selene*, *Gonepteryx rhamni* and *Nisoniades tages* from Cartmel, Lancs.—Mr. S. P. Doudney, *Dryas paphia* and var. *valesina*, also a xanthic male with bleached hind-wings and a female with one hind-wing much smaller than the other, *Limenitis sibylla*, *Zygæna meliloti*, *Gnophos obscuraria* and *Hyria muricata*, all from the New Forest; *Brenthis euphrosyne*, *Numeria pulveraria*, *Hemerophila* and *Notodontidae* from Burnt Wood; also a very dark aberration of *Arctia caja* bred from a larva found at Huyton.—Mr. J. W. Griffin, nice series of the following: *Bombyx rubi*, *Tæniocampa opima* and *Orthosia epsilon* from Wallasey; *Sphinx ligustri*, *Smerinthus tiliae*, *Arctia villica*, *Psilura monacha* and *Catocala nupta* from various localities.—The Rev. F. M. B. Carr brought *Polygonia c-album* from the Mold district, *Tæniocampa opima* from Frodsham, and the following from Delamere; *Abraxas ulmata*, a long series, and *Eupithecia coronata*: he also showed *Plusia moneta* and stated that this year he had found

the larva in his garden at Alvanley. — Mr. W. Mansbridge showed the following from N. Staffs: *Hesperia malvae*, *Nota confusalis*, *Bomolocha fontis*, *Tephrosia biundularia* var. *delamerensis*, *T. luridata*, *Boarmia repandata*, very dark forms, *Eurymene dolobraria*, *Lobophora halterata* and var. *zonata*, and *Eupithecia debiliata*. From W. Yorks: *Odontopera bidentata*, some very yellow specimens; also *Boarmia repandata* var. *nigra* from Knowsley and *Platyptilia ochroactyla* from Co. Durham. — Mr. H. B. Prince, several boxes of Lepidoptera from localities adjacent to Liverpool. — Mr. Leonard West had on view some beautifully drawn plates of various aquatic larvæ.

Meeting held at the Royal Institution, Colquitt Street, Liverpool, November 18th, 1918, Mr. Wm. Webster, President, in the chair.—The following were elected members of the Society, viz. Messrs. Edward Whitley, Ashleigh, Greenbank Drive, Liverpool; S. Gordon Smith, Brantwood, Dee Banks, Chester; Alfred Newstead, F.E.S., Grosvenor Museum, Chester. Exhibits were as follows, viz.: Mr. Wm. Mansbridge brought his series of *Peronea hastiana*, comprising most of the named forms and some unnamed; he also showed the varieties bred this season from larvæ taken on the Lancashire sand-hills. These included vars. *mayrana*, *leucopheana*, *radiana*, *divisana*, *centro-rittana*, and *autumnana*; he stated that var. *mayrana* was the most frequent, the others being only of rare occurrence. — Mr. W. A. Tyerman showed bred series of *Hyponomeuta eronymellus* and captured *Semioscopus phryganella* from localities in the Liverpool district.—Mr. S. P. Doudney, *Odontopera bidentata*, from Rainhill and Delamere; also the local race of *Liparis similis* with brown and tuft from Huyton.—Mr. H. M. Hallett exhibited the pentatomid bug, *Acanthosoma haemorrhoidalis*, usually considered to be attached to birch, but these had been captured a long way from the nearest birch. — Mr. R. Wilding had a large number of Coleoptera from Cartmel, and called attention to the following as being new to the Lancashire and Cheshire list, viz. *Philonthus lucens*, *Silpha nigrita*, and *Scaphidium 4-maculatum*; he further included in his exhibit a very fine series of *Rhagium bifasciatum*, also from Cartmel.

Wm. MANSBRIDGE, Hon. Sec.

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ON THE SPECIFIC DIFFERENCES OF *EREBIA LIGEA*,
L., ITS ARCTIC FORMS, AND *EREBIA EURYALE*,
ESP.

By H. ROWLAND-BROWN, M.A., F.E.S.

In the 'Bulletin de la Société lépidoptérologique de Genève,' vol. iv, May, 1918, under the title " *Erebia euryale*, Esp., quelques-unes de ses Variétés et Aberrations" (pl. i, fig. 1, a 4), Dr. J. L. Reverdin establishes the specific values of *E. euryale*, Esp., and *E. ligea*, L., and appears to solve the problem of the relationship of Hübner's *adyte*. His conclusions are most welcome to those of us interested in the difficult group of Erebias to which the two species belong. Superficially, as well as anatomically, he shows that *ligea* and *euryale* are entirely separate, the androconia markedly different; the appendages sufficiently so to constitute by themselves a test, though Dr. Chapman was not satisfied on this point when he published his "Review of the Genus *Erebia*" ('Trans. Ent. Soc.,' London, 1898).

I give overleaf an abstract of Dr. Reverdin's diagnosis which should help to make the separation of the two species less difficult.

The test difference of ♂ *adyte*, Hb., and typical *euryale* is the disappearance of the dirty white markings, leaving the whole under-side of uniform reddish-brown.

Hübner's figures are *Ligea*, 225-8; *Philomela*, 218-9; *Euryale*, 789-90; and, as an aberration of *Euryale*, an albinistic form referred by Meyer-Dür to *Medea* (*Aethiops*), but by M. Oberthür to *Euryale*, who has given the name *huebneri* to this form, having two ♂♂ and two ♀♀ in his collection. In the copy of Hübner's work in the Walsingham Library at South Kensington all these figures are remarkably fresh and vivid. I agree with Dr. Reverdin's several identifications, while noting that Meyer-Dür states that Freyer's *euryale* (vol. i, tab. 61, figs. 3-4) is "our *adyte*," and further, that Freyer's figures (*loc. cit.*, tab. 91, figs. 1-2) must be regarded as the typical *euryale* of the Silesian mountains.

Ligea.

(IN SWITZERLAND.)

Usually at lower altitudes.	
Larger; wings more elongated.	
F.ws. rusty band broad, and not pinched in in space 3, or scarcely at all.	
On band, 4 fine ocelli pupilled white, ovoid in shape; rarely without pupils.	up. s.
H.ws. band with three pupilled ocelli; sometimes a black spot in the rusty spot anterior to the pupilled ocelli.	
F.ws., uniform chocolate brown; rusty band distinctly defined inwards by concave, outwards by a convex line, both rather regular; rusty band paler than on f.ws. up. s., with 4 ocelli, gr. col. redder, and less deep; band yellowish red, mingled towards in. marg. with a little grey.	un. s.
H.ws. ♀ pure white marking bordering median band, broader at in. marg., festooned with the band almost to posterior limit.	
♂ white marking reduced to small pure white spots separated from each other, and never extended very far; ocelli with rusty circles.	

	<i>Euryale.</i>
Never at the same altitude with <i>Ligea</i> .	
Smaller; wings less elongated.	
Narrower band, and nearly always pinched in in space 3, resembling a figure of 8 drawn out.	
3 ocelli only (rare exceptions); 2 coupled in spaces 4, 5, the 3rd in space 2; ocelli round, and rarely ovoid.	
Band continuous and narrower; 2 or 3 white-pupilled ocelli, or not; but always small, and the black spot very exceptional.	
Band less distinct, and mingling inwards with the reddish-brown ground colour.	

♂ median band scarcely distinct, especially towards the in. marg., where colour scarcely differs from the gr. col.; on outside traces of dirty, never pure, white markings, reduced at some places to points, and often non-existent.
 ♀ med. band clearly defined outside where it is bordered by a dirty white line-mark, which loses itself more or less in the whitish or yellowish col. of the band, at the limit of which are 3 or 4 ocelli (very small in the ♀); in some exs. un. s. unicolorous, and ocelli hardly visible.

This being so, it follows that the name *adyte*, Hb., hitherto applied to the Arctic and Scandinavian form of *ligea*, which I found rather common at Abisko, Swedish Lapland, in 1906, disappears, and I propose for it the name *borealis*. I have gone through the small series I brought home, and find the fourth spot in space 3 on the rusty band of the upper side of the fore wings—typical of *ligea*—and wanting almost invariably in Swiss, and in all my Pyrenean forms of *euryale* from Gavarnie. The characteristic pure white markings on the under-side of the hind wings are present, but much less pronounced than in the type. Dr. Reverdin's discoveries in this respect seem to suggest that this new name is justified for the so-called Arctic *adyte*, and that the title of Mr. Carter's conclusions, presented by me in the 'Entomologist,' vol. xlvi, pp. 34-5 (1914), with a plate (iii), showing the result of breeding experiments from the Lapland form to the normal Harz *ligea*, should be amended accordingly. The extreme Arctic form differs from the normal in the complete absence of the pure white markings on the under-side, but there

are plenty of intermediate forms, as shown by the illustration (pl. iii.).

These intermediate forms are described by Wallengren ('Skandinaviens Dagfjärilar,' p. 52) as follows:

- (a) H. ws. un. s., uniform dark brown with 3-4 ocelli, and a short white streak.
- (b) H. ws. un. s., dark brown with a fulvous band, and the whitish streak more prolonged; ocelli as in the preceding form.
- (c) H. ws. un. s., dark brown, paler towards the base, with whitish band; ocelli obsolete.
- (d) H. ws., as in the preceding form, but without the whitish band.

The last described may be called ab. *obsoleta*, new ab.

Wallengren makes no mention of *curyale*, or var. *adyte* in Scandinavia, and Kirby in his catalogue correctly assigns *adyte* to *curyale*, in this, as in so many other instances where he differs from Staudinger, showing the care with which he assigned his species.

I have examined the several series of *ligea*, *curyale*, and *adyte* in the Natural History Museum, South Kensington, where I find *adyte* placed as a variety (= subspecies*) of *ligea*, but, in all examples from Norway, the rusty band of the fore wings is not pinched in at space 3, and the fourth spot is almost invariably present, though sometimes very small. In the "adyte" from Finland, the under-side of the hind wings is uniform brown, but there is no example without some trace of white on the under-side of the hind wings in the Norwegian series. Of those labelled var. *livonica*, Teich, all the males except one are marked with the white of *ligea*, whereas the distinguishing character of this form is stated to be that the under-side of the hind wings is uniform brown. In my own collection all *borealis* show a trace at least of pure white at the inner margin of the median band.

M. Oberthür says ('Lépid. Comparée,' fasc. iii, p. 331) that he has *adyte* from Bodø which do not correspond with Hübner's figs. 759-60; the form in his collection from Swedish Lapland, "certain examples of which appear to make a passage towards *ligea*," are also clearly of my *borealis* form.† Herr Sparre Schneider, too, has investigated † the relationship of the arctic *ligea* and the suppositious *curyale*. He gives a figure of the upper side of the fore wing of the Tromsö form (in my copy uncoloured) which is certainly *ligea*, and figures the scales of

* Cp. "On the Naming of Local Races, Subspecies, Aberrations, Seasonal Forms, etc.," by Lord Rothschild, F.R.S., etc. 'Trans. Ent. Soc. London,' 1917, pp. 115-116.

† *Erebia ligea* (? *curyale*) var. *adyte*, 'Entomologist,' li, p. 137, should be, therefore, *Erebia ligea borealis*.

† Tromsö Museums Aarshefter 15, 1892.

the two species. Lampa and Aurivillius both assign this arctic form of *ligea* to *adyte*, Hb., "smaller than the type. Hind wings under-side nearly unicolorous."

I may add that the real *adyte* taken by me on the Brenner, ♂ and ♀, might have served as the models of Hübner's brilliant figs, 759-60, and I have no doubt that they represent a form of *curyale* and not of *ligea*, which is the conclusion of Dr. Reverdin, who also considers that these figures fit exactly the majority of Swiss *curyale*.

Ligea from the Vosges (P. J. Barrand, St. Maurice-sur-Moselle), Carinthia, and the Alpes-Maritimes in my collection exhibit in the males a considerable range of variation. In the Vosges series the males are deep black brown: the rusty band band is bright, the ovoid ocellations white-pupilled, and the spot in space 3 invariable. In the Alpes-Maritimes examples (St. Martin-Vesubie, July, 1902) the ground colour is a shade lighter, the band is broader and somewhat duller in tone, the spot in space 3 often obsolescent or wanting, and the ocellations devoid of pupae, or almost so. This form has been named *polymyna* by Frühstorfer, and the Piedmontese examples in the National Collection are identical with mine from the Alpes-Maritimes, as might be expected. But his var. or subspecies—meaning local race, for he is great at the invention of the latter—*etolana* clearly belongs to *curyale*, and not to *ligea* at all.

Curyale, from the Hautes-Pyrénées, though varying indefinitely on the upper side of the fore wings, is true *adyte*, Hb. So far as I know, *ligea* has never been reported on good authority from the Pyrenees, though I should not be surprised were it to be discovered in the western extremity of the range where so many unexpected northern and north-eastern Lepidoptera recur, for example *Trachina tervana*, reported by M. Rondou, on the authority of M. Gerardin, as well distributed in the neighbourhood of Oloron, in the Basses-Pyrénées.

Dr. Reverdin also describes and figures a distinct race form from Transdanubia which differs in a pronounced way from the *curyale adyte* of the Alps, and approaches in certain particulars, especially in the uniform not pinched in, arrangement of the band of the fore wings, the Silesian type. For the Gurnigel form, erroneously named *phalanta*, he proposes *segregata*, and notes that it is a transition form to *ocellaris* of the Tyrol, of which, again, the entirely black ab. *extrema*, Schawerda, is the extreme form.

SOME STEPHANIDI IN THE BRITISH MUSEUM.

By E. A. ELLIOTT, F.Z.S., F.E.S.

In the 'Entomologist,' 1917, p. 107, Mr. Morley described as new, *Stephanus nitripes*, noting also three specimens from

the Solomon Islands, the ♀ bearing a label "*Megischus Froggattii*, Cam. type." which he believed to be only a manuscript name, having overlooked Cameron's description in the 'Proc. Linn. Soc. N. S. Wales,' 1911, p. 357, the 'Zoological Record' for that year not being at the time available. I also missed other records from the fact of *Megischus* being placed among the *Evanidæ*. Morley's name must fall, and go to swell the list of synonyms. The dimensions of the three specimens are: ♀, length 33 mm., abdomen 22 mm., petiole 10 mm., terebra 35 mm.; ♂, length 16 mm., abdomen 11 mm., petiole 4½ mm.; and in the smaller ♂, 12, 8, 3½ mm.

Parastephanellus damellicus, Westw. Of this species there are now in the Museum seven ♀ ♀, taken by R. E. Turner at Mackay, Queensland, and one ♀ from the Swan River. They vary in size from 6½ to 13 mm., the terebra from 7 to 14½ mm. The type specimen at Oxford measures 8½ mm., with the terebra only 8 mm. This difference in the proportional length of the terebra seems scarcely sufficient to found a new species.

Fænotopus rugiceps, sp. n.

♀. Frons granulate rugose, vertex and occiput subarcuate rugose, the temples smooth and shining. Frontal tubercles rather small and blunt, the space between them rugose: three carinæ between the posterior ocelli. Posterior margin of head strongly bordered. Scape longer than cheeks, second flagellar joint not quite half as long again as first, third about as long as first and second together. Prothorax strongly trans-striate, with rather broad, smooth posterior border; mesonotum coarsely punctate, apically smooth: propleurae lightly punctured, mesopleurae basally punctate, apically smooth; metapleura coarsely punctate, separated by a row of punctures from the median segment, which has large, diffuse punctures. Petiole trans-striate, as long as rest of abdomen, which is finely alutaceous. Terebra shorter than body, basally rufescent, the colour gradually passing into an ill-defined subapical yellowish band, extreme apex black. Hind coxae coarsely trans-rugose, their femora tridentate; the basal tooth broadly triangular, the central one longer and more rounded, the apical narrow and sharply pointed; hind tibiæ constricted in the basal two-thirds. Wings feebly infuscate, nervures blackish.

Black; head rufo-testaceous, frons and vertex blackish, face and base of mandibles testaceous. Front legs rufo-testaceous, femora darker; middle legs lighter, with base of tibæ and rather more than the basal half of metatarsus white; hind legs rufescent, the basal and central femoral teeth white, the apical black, apex of tibæ and the metatarsus except its apex white.

Length 12 mm., abdomen 7 mm., petiole 3½ mm., terebra 10 mm.

South India, F. Smith coll.

Type in British Museum.

The type specimen bears a label with the manuscript name "*F. ruficeps*, Smith." A red head is very common in this

subgenus, and in no way distinctive. The rugosity of the head appears more characteristic.

The majority of the species of this subgenus appear to have the hind femora bidentate; the present species may be at once distinguished from all others by the colour of the femoral teeth.

Fornatopus iridipennis, sp. n.

♀. Frons arcuate rugose, vertex and occiput finely and distinctly trans-striate, temples smooth and shining; two short carinae between the posterior ocelli; posterior margin of head bordered. Scape as long as cheeks, second flagellar joint twice as long as first, third as long as first and second together. Neck of pronotum smooth, rest trans-striate with narrow smooth posterior margin. Mesonotum with large, well separated punctures. Propleurae finely striate, mesopleurae finely alutaceous, metapleurae and median segment cibrate punctate, separated by a carina. Petiole trans-striate, extreme apex smooth, as long as rest of abdomen; base of second segment trans-striate, remainder smooth. Terebra half as long again as body, white sub-apical band 2 mm. broad. Hind coxae finely trans-striate, their femora tridentate, and tibiae constricted in the basal two-thirds. Wings hyaline, strongly iridescent throughout, nervures black.

Black, head red, vertex black; the anterior tubercle has its front half red, the posterior half black. Anterior legs and hind tarsi testaceous, base of middle tibiae and their metatarsus testaceous.

Length 15 mm., abdomen 10 mm., petiole 5 mm., terebra 22 mm.

Dehra Dun, India, November, 1907 (Lt.-Col. F. W. Thomson, I.M.S.)

A male, tentatively placed with this ♀, differs in the finer sculpture of the head, and in the striate metapleurae. The base of the antennae and the head are testaceous, with the vertex and occiput black. A very slender insect. Length 11 mm., abdomen 7 mm., petiole 4 mm.

Ivandra Valley, 4000 ft., July, 1889 (Dudgeon).

The sharply defined red colour on the frons, including just one half of the anterior tubercle, is unusual. May be distinguished from *F. longicauda*, Elliott, by the striate occiput, smooth neck of prothorax, and by the posterior margin of the meso-tergite being simple, not bordered.

Fornatopus longicauda, sp. n.

Frons trans-striate, vertex finely trans-striate, occiput and temples smooth and shining, frontal tubercles short and blunt; three short carinae between the posterior ocelli. Posterior margin of head simple. Scape as long as cheeks; second flagellar joint twice as long as first, third as long as first and second together. Prothorax finely trans-striate, mesonotum cibrate punctate; mesopleurae smooth, with a few large punctures in the middle; metapleurae coarsely punctate above, smooth below, separated by a crenulated furrow from the cibrate punctate median segment. Petiole trans-striate a little longer than rest of abdomen, which is smooth and

shining. Hind coxæ trans-striate, hind femora very finely alutaceous and rather shining, tridentate; hind tibiæ compressed to a little beyond middle. Terebra half as long again as body, with a sharply-defined subapical band, 2 mm. broad, and $1\frac{1}{2}$ mm. at the apex black. Wings basally infuscate, nervures black.

Black; mandibles except apex and face pale testaceous; anterior legs rufescent, tibiæ paler; hind tarsi rufescent.

Length 15 mm., abdomen 10 mm., petiole $5\frac{1}{2}$ mm., terebra 22 mm.

Nilgiri Hills, India, 3000 ft., April 14th, 1888 (Sir George Hampson).

Type in British Museum.

Very like *F. iridipennis*, Elliott, but easily known by the infuscate wings and the smooth occiput with simple posterior margin.

Fœnatopus claripennis, sp. n.

♀. Frons arcuate trans-rugose, vertex subarcuate trans-striate, with distinct central longitudinal furrow, occiput more finely striate. Posterior margin of head bordered. A long, stout carina just in front of the posterior ocelli, and two shorter ones between them. Scape as long as the cheeks, second flagellar joint one and a half times as long as first, third nearly as long as first and second together. Neck of prothorax coarsely, obliquely striate, the remainder alutaceous; metanotum moderately punctate. Mesopleuræ alutaceous, basal half diffusely punctate; metapleuræ nearly smooth, with large, diffuse punctures, separated by a line of punctures from the similarly sculptured median segment. Petiole trans-striate, apex smooth, as long as rest of abdomen. Terebra shorter than body, black. Hind legs with the coxæ trans-striate, femora tridentate and very finely alutaceous, tibiæ constricted to middle. Wings very clear hyaline, apical half iridescent.

Black; head rufescent, vertex darker; tegulae, basal half of petiole and its apex broadly, second and third segments basally red. Anterior legs rufescent, femora centrally and tibiæ partly darker, middle metatarsus yellowish, hind legs black, apex of femora, the tibiæ and tarsi rufescent.

Length 15 mm., abdomen 9 mm., petiole $4\frac{1}{2}$ mm., terebra 13 mm.

Nyassaland, Chiromo, Ruo River (R. C. Wood), 1916.

Type in British Museum.

The long red carina in front of the posterior ocelli and the sculpture of the prothorax distinguish this species from all others.

Diastephanus elegans, sp. n.

♀. Frons finely arcuate striate, vertex trans-striate and occiput nearly smooth. Space between the posterior ocelli trans-striate. Posterior margin of head bordered. Second flagellar joint twice as long as first, third as long as first and second together. Pronotum very finely trans-striate and rather shining, basal margin smooth; mesonotum almost smooth. Central lobe of scutellum finely

punctate. Propleurae finely striate, mesopleurae smooth and shining, metapleurae and median segment cibrate punctate, separated by a carina. Petiole extremely finely trans-striate, shorter than rest of abdomen, which is smooth and shining. Terebra shorter than body, white banded. Hind coxae trans-striate, their femora bidentate, tibiae compressed to the middle.

Black; head rufo-testaceous, vertex slightly darker; three basal joints of antennae, prosternum, tegulae and anterior legs rufo-testaceous, the femora rather darker, tarsi paler, middle metatarsus white; hind legs darker with the metatarsus paler. Femoral teeth white.

Length 6½ mm., abdomen 3½ mm., petiole 1½ mm., terebra 5 mm.

Singapore (H. N. Ridley, 1900).

Type in British Museum.

A delicate insect; distinguished by the space between the ocelli being striate, instead of, as usual, carinate; and by the white femoral teeth.

Diastophanus flavonotatus, sp. n.

♂. Frons extremely finely transversely coriaceo-rugose; vertex with four carinae; occiput short, finely trans-striate, its posterior margin simple; temples smooth and shining. Anterior frontal tubercle almost obsolete. Scape a little shorter than cheeks; second flagellar joint one and a half times as long as first, third fully as long as first and second together. Neck of prothorax elongate and slender, the pronotum obsoletely trans-striate, becoming subnitudinous towards the base, with a short longitudinal fovea. Scutellum smooth, mesonotum nearly smooth. Pro- and mesopleurae smooth, the latter diffusely punctate; metapleurae smooth in front, reticulate rugose behind, median segment coarsely punctate. Petiole very finely trans-striate, shorter than the remaining segments, which are strongly nitudinous. Hind coxae slender, trans-striate, their femora smooth, with two large white teeth, tibiae compressed to beyond middle. Wings hyaline, iridescent; nervures pale fuscous.

Black, frons flavous, vertex ferruginous, occiput blackish. Vertex testaceous, pronotum subrufescent. Anterior legs rufo-testaceous. Hind coxae black, femora ferruginous, centrally paler; tibiae darker, laterally, and the metatarsus flavous, other tarsal joints rufescent. Petiole black, remaining segments rufescent, a large circular flavous spot on third segment on each side near base.

Length 10 mm., abdomen 6 mm., petiole 3 mm.

Hab. Kuching, Sarawak, N. Borneo, May 14th, 1900.

Type in British Museum.

This may prove to be the ♂ of *D. leucodoutus*, Schlett., also from Sarawak, with which it agrees in the obsolete anterior tubercle, short occiput, and very largely in the sculpture. The round flavous marks on the third segment are distinctive, and I do not feel sure enough of the connection to unite the two.

DIPTEROUS HOSTS OF STILPNID ICHNEUMONS.

By CLAUDE MORLEY, F.Z.S., &c.

My article upon the ubiquitous *Atractodes tenebricosus*, Grav. (*vestalis*, Hal.), in 'Ichn. Brit.' ii, 1907, p. 247—wherein read "mandibles" for "cheeks" at 1, 17—concludes with the assertion that "I can find no record of its parasitism"; and I am now satisfied that none had been published up to that time. Consequently, it is very satisfactory to put on record later discoveries respecting this Ichneumonid's economy, and the latest of these is so definite an example that I hasten to publish it.

Two puparia, bearing a stout horn on either side above the anus and another bifurcate nearly to its base below it, were shaken by Mr. J. W. Carter from the moss of a mountain stream while searching for the Staphylinid beetle, *Lestiva luctuosa*, on May 20th, 1918, at Malham, near Settle, in West Yorkshire. A week later there emerged from one of these puparia the common Anthomyid fly, *Melanochila (Calliophysa) riparia*, Fln., ♀, and from the other similar puparium the equally common Stilpnid ichneumon, *Atractodes tenebricosus*, Grav., ♀, which is thus conclusively proved to destroy *M. riparia* after the latter has pupated.

This parasite probably attacks numerous species of Anthomyid Diptera, for I have examined a pair that alone were bred, the ♀ at the end of March and the ♂ on May 2nd, 1914, from 506 puparia of *Chortophila brassicæ*, Bouché, by Mr. J. T. Wadsworth, and recorded by him in the 'Annals of Applied Biology,' ii, p. 159, July, 1915.

These definite observations go to show that the position of the Stilpnides (whereof *Atractodes* forms part) is at length correctly settled near *Phygadeuon*, since at least some species of the latter genus are known to equally prey upon Diptera. In 1907 there were no more than Brischke's record of *Stilpnus gagates* from *Anthomyia radicum* ('Schr. Nat. Ges. Dantzig,' 1882, p. 178), and Thomson's of *Exolytus incertus*, "Utläckt ur en Syrphid-puppa" ('Opusc. Entom.', x, 1884, p. 1021) pointing in this direction; while on the other hand the former author himself thought he had bred other species of the same tribe from sawflies, and there are ('Entomologist,' 1881, p. 139, and 1882, p. 223) records from Lepidoptera. These may now safely be accounted errors along with the rearing of *Stilpnus deplanatus*, exhibited at a meeting of the South London Entom. Soc. on March 24th, 1887, "bred from the larva-case of a species of *Psyche* found on a fence in a garden at Peckham." If further proof of Dipterous hosts were requisite, it is supplied by a ♂ and two ♀ ♀ of *Atractodes bicolor*, Grav., which were sent me, raised, too late for inclusion in his paper on "Observations on

the Habits and Parasites of Common Flies" ("Parasitology," viii, 1916, pp. 440-544), by Graham-Smith during June and October, 1916, in Cambridge.

A SEASON'S COLLECTING IN THE ALPES-MARITIMES.

BY CHARLES E. MORRIS.

(Concluded from p. 29.)

PIERIDÆ.—*Aporia crataegi* swarmed at the "drinking bars." The peasants take a sack from a mule's back when passing, and slaughter them in hundreds. They think it is the cabbage-eater.

Pieris brassicae, not very common; *P. rapæ* not very common; *P. manuæ*, one male taken; *P. napi*, and male vars. *sabellicæ* and *nanaæ*, var. *bryoniaæ*, females, and one example ? *sulphurea*.

Pontia callidice, a damaged but fresh female in the valley of the Rabious at flowers about 8.30 a.m. I was disappointed not to get this butterfly in series, but it is rare here I fancy. Perhaps I was not high enough. *P. daplidice*, with *gen. veru. bellidice*.

Enchlos ausonia, Hb. (*simplonia*), not very common, a small, fresh series; *gen. aest. turatii*, Rothsch. (= *belia*, Auct.), very worn, might be males of *ausonia* (= *simplonia*). *E. cardamines*, ab. *citrona*, Wh., on the wing very long; perhaps a second emergence. Three interesting female forms taken—one very small, one with large lizard-shaped white marks on the underside of the hind wings, one with an entirely white half of the left underside hind wing.

Leptista sinapis, *gen. veru.* *Gen. aest. diniensis*, apical tips not very black, and females not quite of the *crysimi* form. Ab. *lathyræ*, and ? var. *sartha*.

C. liris phricomone, plentiful, and of good colour. *C. palæno*: I feel sure I saw a splendid male example on the Cime de Bercia. M. Massart found large patches of *Vaccinium uliginosum* on this mountain. *C. hobia*, common, females very white, neither sex very heavily bordered; two gens. *C. edusa* not very common, two emergences; June and July, a few seen; August, September, October, and still coming out when we left. Ab. *pallida* (= *helia*) seen at St. Etienne; and with the type at Cannes in mid-November. These later emergences are of a much deeper orange than the summer form.

Leucopteryx monina, common. *G. cleopatra*, a single male seen. This appears to be the limit for height of this insect. It was very scarce at about the same altitude at Beauvezer in 1914.

NYMPHALIDÆ.—*Dryas iulia*, neither sex very highly coloured; ab. *alexis*? one or two seen. First seen July 28th—an extraordinarily late date for the species. Not common.

Argynnis aglaia, males large and highly coloured; females bright clear brown, very slightly greenish at the base and large. Small males seenred at Roya and Gialorgues (= ab. *nana*). *A. cydippe*, rich red brown; var. *cleodoxa*, and no doubt ab. *intermedia*. *A. niobe*, two forms; the form, which is out a week before *aglaia*, as in the Basses-Alpes also, is large, and has a flush of salmon in the orange-brown—a very bright tint, ? another species; later one finds the ordinary form, and var. *eris*, various depths of colour and suffusion. As a rule the smaller the specimen the darker; the females pale and show light purple lustre in the black markings.

Issoria lathonia, the first (?) emergence, May and June, nothing like as bright as the later ones (? hibernates) with two gens. emergences—July and August, August and September.

Brenthis euphrosyne, males large and bright; females scarce, and rather lighter than the males in the same key of colour, and not shaded with bronzy-purple as in the female *pales*. A male taken with large black lunules confluent with the antemarginal band of black dots. *B. daphne*; at bramble and clematis: males plentiful, but females very difficult to get at. *B. amathusia*, common in many localities, and bright. *B. pales*, found in several places, but never very common as in the Basses-Alpes; perhaps a bad year. Typical males not very strongly marked; females pale.

Melitaea cynthia: the larvæ abounded, and were starving, having devoured all the *Plantago alpina* to the root stock. Garlands of chrysalids were hanging to grass-stems. A photograph was taken by M. de Selys Longchamps, and a box of larvæ and pupæ brought to me. The larvæ I fed up on *P. lanceolata*, and the large-leaved kind. My resulting imagines were of a poor, not richly coloured form. A finer form occurred on the Cime de Bercia, but I was a few days late, and an awful wind-storm the day before I went there had spoiled all of them. *M. phœbe*, males brilliant and varied, one a fine light ochre colour well blotched with black; banded forms of yellowish and orange-red, heavily spotted velvety black. Females. very rich, some all basal and median area black with border of red spots after the style of *athalia* ab. *navarina* (? ab. ♀ *saturata*). One male example dark mahogany tint with much black suffusion (? ab. *saturata* ♂, Stgr.); vars. *occitanica* and *aetheria* occurred also. *M. cinxia*, small narrow-wing forms. One male almost black, fore wings sharply elongated at the apex (? *cinxina*). Females, larger, pale ochre tinged greenish, the later emergence more typical. *M. didyma*, common; males, bright red ochre, some very slightly spotted black, others more as in the Le Cannet neighbourhood. One cream-coloured male taken. Var. *occidentalis*, I took about fifteen different female forms, some very pretty, almost black to pale biscuit and creamy-fawn grounds,

and reddish orange-brown with greenish fore wings. *M. deione*, a nice series of both sexes, two forms of the male, one being duller and darker with smaller black markings than the larger and brighter form. Females, large-banded orange. This is the first time I have had the pleasure of meeting with *deione*. *M. parthenie*, I took one male just out, and never saw any more. *M. athalia*, abundant, many forms, and some nice vars., including two ab. *nucaria*, ♂ ♀ : ab. *virgata*, some very pale, and var. *helvetica*, or allied to it : the females very varied also. *M. dictyna*: the males abundant, with almost black hind wings; females very scarce.

None of the Vanessas were common as imagines. *Pyrameis cardui*; *P. atlanta* very bright, and females with white spots in the band. *Euvanessa antiopa*, *Vanessa io*, *A. urticæ*, *Eugonia polychloros*, *Polygonia c-album*, all abundant in the larval stage, I should say 90 per cent. ichneumoned. Of about fifty mixed, I got no *cardui*, two *urticæ* and one *c-album*.

Limenitis camilla not common. *L. populi*: a Belgian friend declared that he saw one on the Col d'Anelle, where there is much poplar and aspen. It is possible that it was *Apatura ilia*, but I met with no *Apaturidæ*, either *A. iris* or *A. ilia*.

SYRVIDÆ.—*Pararge maura*, var. *adrasta* fairly common, but not so plentiful as at Beauvezer. *P. hiera*, most difficult to get females; ab. *trinoculata*, Wh., occurs; *P. megæra*, very scarce, a few in September; *P. egeria*, one female in October, var. *camonea*.

Satyrus cordula common; females same as males, a trifle lighter, with, of course, larger eye-spots; but no tawny colour, *? actaea*.

Epinephele jurtina, and intermediate forms to *hispanica*, not very abundant. *E. incoronata* very abundant; females varied in size and colour and size of eye-spots; some males with extra eye-spots and more or less tawny patch and of very large size.

Cirrochroa phaonius. *C. dorus*, males with dark suffused fore wings, females with pale fawn wings. *C. pamphilus*, pale females.

Frebia papilionis, vars. *mnemosyne* and ? *cassiope*; *F. melampus*, *F. minstra*; *F. alecto* ? ?, one example only. *F. medusa* ?, *F. stygne*, very black, *F. eris*. *F. scipio*. I find that two butterflies, at first supposed to be *F. gorge* var. *erinnys*, are, to my great delight, two perfectly fresh *scipio* ♂♂. I am very pleased to have taken this fly at last. Both were captured in a small ravine at *Cetraanthus*, or false valerian, and I now feel sure that a female was also there a few days later which I missed. It appeared to be a very light and, as I thought, faded *stygne*. *F. euryale*, and vars. *adulta*, Hb., and *euryaloides*. *F. ligea*, *F. neoridas*, very common (various). *F. gothane*, *F. gorge*, *F. tyndarus* var. *cassiodoides*.

Melanargia galathea, widely dispersed, but never abundant. I did not find any forms so dark (*procida*) as in the Basses-Alpes.

Moths were not abundant, nor properly worked for. My list is of little account, but *Psodos alticolaria* is a good thing, and *Calpe capucina* is very interesting. *C. optata* is rare. St. Etienne does not appear to be very rich in Anthrocerids. I observed *erythrus*, *purpuralis*, *loniceræ*, *astragalæ*, *transalpina*, *hilaris*, *fausta*, *bætica*, *achilleæ*, *scabiosæ* forms, *dubia*, *filipendulæ*? and *minos* on the Col de Gialorgues, with *Adscita staticæ*, *Rhagades globulariæ* and *Naclia ancilla*. Other Heterocera seen were *Egeria chrysidiiformis*, *Hemaris bombyliformis*, *H. tityus*, *Macroglossum stellatarum*, Catocalids, *Catocala nupta*, *C. elocata*, with fine dark bands on the fore wings, one example of *C. optata*, and two or three *C. puerpera*. Larvae of *Calpe capucina* were taken from *Thalictrum*, and all emerged. I observed about forty *Herse convolvuli*, all on telegraph posts. Other *Sphingidæ* were *Sphinx ligustri*, males fine and dark, one *Hyloicus pinastri*, *Smerinthus ocellatus*, *Mimas tiliæ*, *Amorpha populi*, *Theretra porcellus*, larvae, and imagines. Larvae of *D. respertilis* common on *Epilobium rosemarinifolium*. Of the Arctiidæ, *Rhyparia purpurata*, *Arctia caja*, *A. fasciata*, *Callimorpha dominula*, *Parasemia plantaginis*, and *Setina aurita*, var. *ramosa*, red form, may be mentioned; and of other genera *Lemonia taraxaci*, *Malacosoma neustria*, *Lasiocampa quercus*, and *Dasychira fascelina*.

The following list of Geometers is, I fear, somewhat meagre, and some of the species included are from memory, while the identity of the several *Gnophos* is uncertain. Beauvezier struck me as being far richer in moths of all kinds than St. Etienne, where hardly anything came to the hotel lights. *Pseudoterpnia pruinata*, *Euchloris smaragdaria*, *Nemoria viridata*, *N. pulmentaria*, *Thalera fimbrialis*, *Acidalia trilineata*, *A. flareolaria*, ? *A. similata*, *A. nemoraria*, *A. punctata*, *A. ornata*, *Rhodostrophia vibicaria*, *R. calabria*, *Semiothisa liturata*, *Opistographitis eratægata*, *Gnophos furvata*, *G. pullata*, *G. glauciata*, *Psodos alticolaria*, *Fidonia limbaria*, *Ematurga atomaria*, *Thamnonoma wanaria*, *T. contaminaria*, *Cleogene lutearia*, *Lythria sanguinaria*, *Ortholita limitata*, *O. mœniata*, *O. plumbaria*, *O. bipunctaria*, *Phasiane clathrata*, very dark, *Aspilates gilvaria*, ? *Aplasta onoraria*, *Odezia atrata*, *Anaitis præformata*, *A. simplicata*, ? *Encosmia certata*, *Triphosa sabaudiata* ?, very worn, *Lygris prunata*, *Larentia cyanata*, *L. verberata*, *L. parallelolineata*, *L. tristata* or *luctuata*, *L. designata*, *Abraxas grossulariata*, *A. marginata*, *Venilia macularia*, two or three forms, the pale yellow being common in the Val d'Ardon, *Scoria lineata* (*dealbata*).

ERRATA ET ADDENDA.—*P. 16, l. 25*, for “Serrière” read “Sestrière.” *P. 17, l. 4*, delete *H. fritillum*, etc., and add *H. andromedæ*, one ♂. *Id., l. 31*, for “flawed” read “flamed,” and in *l. 39* add *C. alciphron* var. *gordius*, ♂ ♂ plentiful; ♀ ♀ very large. *P. 18, l. 34*, for “none” read “some.”

GLEANINGS FROM MY NOTEBOOKS—IV.

BY J. W. HESLOP HARRISON, D.Sc.

Brethis euphrosyne, L. Once fairly abundant and widespread, this insect, like *Argynnis aglaja*, is now restricted to the west of Durham and Northumberland, particularly in the district between the Tyne and Derwent : in that area it still sometimes abounds, and can be readily found in the larval condition in April and May. I have found the larvae in some numbers crawling over fairly deep snow early in the former month. April 20th is a good average date to look for the larva, as it suns itself everywhere *savu* on the food-plant. On one occasion I found a pupa suspended from a bramble stem about a foot from the ground. The insect has similarly vanished from Cleveland, although I have seen odd specimens captured within the last dozen years.

Brethis selene, Schiff. Exactly in the same plight as the last insect, and even more limited in its habitats. When the larvae of *B. euphrosyne* are more than half grown, those of the present species are either in winter quarters or just emerging therefrom as very small larvae. The first week in June is the best period to search for them, but compared with those of its congener they are very hard to find : as a matter of fact, my friend Johnson and I have found as many scores of *B. euphrosyne* larvae as individuals of *B. selene*. Curiously enough we have never had parasitised *B. euphrosyne*, whilst both of us have had *B. selene* stung. The females of both insects lay freely when enclosed over *Viola odorata*, *V. canina*, *V. hirta*, *V. sylvestris*, *V. lutea*, *V. cornuta*, *V. gracilis* or any cultivated viola or pansy, and exposed to sunlight or incandescent gaslight. *Brethis dia* behaves similarly, but whilst the larvae of the first two insects uniformly hibernate with me, those of *B. dia* (from Swiss females) spin up and emerge the same year.

Eriina otho, Esp. (*blandina*, F.). Now practically exterminated from Durham. On the last occasion I looked for it I found one solitary individual near Thornley and Wellfield Stations in its old haunts. I had a letter from one exterminator to the effect that he couldn't understand its disappearance when just a short time ago he could go any afternoon early in August and come home with 200-300 specimens in his boxes ! Elsewhere I have seen it in great numbers in all the clearings in Altyre Woods, Forres, along the River Findhorn and on to the landward side of the birch wood on the Culbin Sands. It likewise abounds on the edge of some inundated land before one reaches the sands. Whilst it generally rests amongst the grasses (more especially *Deschampsia flexuosa*, which seems to be the preferred food-plant wherever I have worked), I have beaten it out of *Salix repens*, *Betula alba* and *Pinus sylvestris*. It is one of the easiest butterflies to pair and to secure ova from, these functions taking place even in a small cardboard box in the dark.

Zephyrus quercus, L. Never very common in our counties, and deemed to be extinct of recent years : nevertheless, I have seen it in the last year or two in Ravensworth and other woods in the Team Valley, N. Durham. My friend Bagnall likewise reports it as still occurring in Gibside, one of its former well-known localities.

Iphiclus podalirius, L. Possibly the remarks I have to make with regard to this butterfly have no scientific value, but, on the contrary, they may have when one considers that no fewer than five other migrant butterflies have been detected in Durham and Northumberland in May and June this year. As I noted earlier in this series of papers, I have observed *Vanessa io* myself, as well as *Pyrameis cardui* and *P. atlanta* ; Lord Armstrong reported *Euvanessa antiopa* at Rothbury, Northumberland, whilst a correspondent undoubtedly saw a *Colias edusa* in the same county. Furthermore, when watching the habits of *Odonata* as they sported over a marsh near Birtley, I noticed what I took to be the same insect commit suicide by diving straight into the water. As I returned home I saw a huge butterfly fluttering amongst the waggons at the "Tail" near the "New" Pit. I got near enough to ascertain that it was *Iphiclus podalirius* and to chase it along the waggon-way for some time. Finally it sailed over the wall into the ironworks and I lost sight of it. In normal times I should have assigned its presence to the accidental importation of the pupa with the fodder and timber used at the colliery, but in both cases the collieries are relying on home-grown supplies. As a consequence one is driven to conclude that the *Papilio* was an immigrant like the other species.

Lithosia complana, L. Except for one isolated example of the present species I have never captured a *Lithosia* in my life ; this specimen was taken off the walls of Middlesbrough High School.

Diacrisia russula, L. Another insect I have only taken once ; this occurred in the form of a fertilised female which I netted in Lonsdale, Cleveland.

Cleoceris riminalis, F. I have been accustomed to beat odd specimens of the larvæ everywhere in our counties from *Salix caprea*, *S. aurita* and *S. cinerea*, but I never before saw it in such countless numbers as were stripping certain examples of *S. cinerea* in the Derwent Valley this year. It would have been easy to secure thousands from three or four adjoining bushes. With us the whole range of variation is displayed.

Acetobia præcox, L. A very limited number scraped out of the crests on the sand hills on the Moray Firth between Findhorn and Burghead.

Plusia festucæ, L. Very rare with us ; larvæ on sedges, Billingham, S. Durham ; imagines, Alston, Cumberland.

Thera simulata, Hb. Juniper is not a common plant in

Durham, but it occurs in the upper parts of both Tees, Wear and Derwent Valleys, as well as on the Magnesian Limestone on the coast; it likewise grows on the Coal Measures not far from Birtley. In the last locality no juniper insects have been detected except *Lachnus juniperi* and *Oligotrophus juniperinus*, but almost certainly the other localities have supported, or do support, *Thera simulata*. I say advisedly "have supported," because the juniper has practically vanished for some unknown reason from the coast, and no captures of the insect had been reported for years until I captured a single example in 1914 at Black Hall Rocks. My friend Johnson has netted it on Stanhope Moor, which appears to be an addition to the known localities, unless it be the same as that otherwise called "Wolsingham" in Robson's Catalogue.

Larantia casuata, Lang. Quite a common insect on all of the moors in Durham, Northumberland, providing they are not too low-lying. The larva is a much more general feeder than supposed, and it can be beaten from, or collected from, *Erica tetralix*, *E. canina*, *Calluna vulgaris*, *Empetrum nigrum*, *Salix repens*, *Vaccinium myrtillus* and *V. vitis-idaea*. In degree of melanism exhibited, those from the Cleveland moors far surpass those sent out in such profusion from Scotland, which more nearly approach those I have seen in multitudes resting on the fences crossing Whitfield Fell in West Allendale, Northumberland.

Chimarra borealis, Hb. Somewhat local with us and very patchy in its special haunts, although plentiful where it does occur—Lonsdale, Cleveland; Ebchester, Northumberland; Hurworth and Chopwell, Durham.

Acalia umidula, Hfn. Neither in Scotland nor in the north of England can this be described as other than rare. I have noticed it at Birtley, Durham; on ragwort both at Kinghorn, Fifeshire, and Forres, Elgin. Very plentiful and variable along the Orriter Road, Cookstown, Tyrone, and near a village which I couldn't find; known as Mackney in the same vicinity.

Amphidasys betularia, L. Not uncommon wherever I have collected in Great Britain. Black and dark intermediates (never the type) in Durham; black in Northumberland; black in the neighbourhood of Middlesbrough; black and intermediate on Eston Moor; type in Lonsdale—all three localities in Cleveland; type at Kippen in Stirling and Forres.

Himera pannaria, L. Sparingly at Eston, Cleveland, on larch; Lonsdale on alder, Easby Wood on oak; in Durham in the Derwent Valley on oak, alder, birch, *Calluna*, etc., the last-named being to me a very unusual food plant.

Notodonta tremula, G. Sparingly everywhere in Durham, Northumberland and Cleveland, even on poplars in the streets of large towns such as Middlesbrough and Gateshead; also taken at gas-lamps at Forres.

Drepana lacertinaria, L. Both imago and larva beaten freely from birch at Kippen and Forres.

D. falcula, L. Very typical imagines from birch on Strensall Common, Yorkshire, and Chopwell Woods, Durham; fine whitish forms beaten from birch both as larvæ and the perfect insect at Kippen, Stirling, and Forres.

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THE LARVAL HABITS OF *DIORYCTRIA ABIETELLA*.

BY ROBERT ADKIN, F.E.S.

IN view of Major Smart's remarks on this species (*antea*, p. 21), it may not be out of place to relate my own experiences, which, although by no means extensive, may help to throw some light on a much-debated subject. On May 15th, 1886, a friend and I were collecting pine-shoots for *Retinea* larvæ at Oxshott, Surrey, when my friend met with what appeared to be the dead shoot of the previous year's growth; the buds that should have made their present year's shoots were brown and dry, and surrounded by a good deal of resinous exudation—no doubt produced by a *Retinea* larva that had fed there in the year before. But, as it evidently contained a larva of some sort, it was taken, and eventually produced a fine *D. abietella*. The tree was a small *Pinus sylvestris* not more than some four feet high, and the shoot was the leading one. Again, on March 18th and May 15th, 1891, I received a number of shoots of *Pinus sylvestris* from Forres containing larvæ of *Retinea resinella* in their conspicuous resinous nodules; the pine-shoots, all of which were of a previous year's growth, were stuck in damp sand in a large flower-pot and covered with fine net. On June 14th I noticed some fresh reddish-coloured frass protruding from a hole in the side of one of the shoots, and further examination proved that several of them were similarly affected. The *resinella* had all long since pupated, and the majority of the moths had emerged; it was therefore clear that I had here some other species feeding, not in or about the nodule, but in the hard, dry twig some distance below it. A few days later one of these larvæ was seen to be spinning a cocoon just between the top of one of the resinous nodules and the bark of the twig, apparently having found its way up through the old workings of the *resinella* larvæ, and between July 17th and 26th six fine *D. abietella* emerged from similar positions. Although in both the cases mentioned resinous excrescences were present, I am quite clear, from observations made and noted at the time, that the *abietella*

larvae had nothing whatever to do with causing them, nor indeed were they of any consequence to the larvae, but there is a possibility that the fact of the twigs having been previously tenanted by other larvae may have been an inducement to the *abietella* to select them. Further, it is significant that in a much larger number of pine-shoots infested by *R. resinella* received from the same locality in the autumn of the previous year no *abietella* larvae were found. Both these observations appear to suggest that the *abietella* larva take to these old workings only after hibernation, and may to some extent help to reconcile the many conflicting accounts of their habits. There is no doubt that much confusion has existed between the larva of this species and that of *It. splendidella*, both in regard to the descriptions of the larva and their habits; Barrett ('Lepidoptera of the British Islands,' ix, pp. 413-417) has done much towards clearing this up, but there are many points in regard to the economy of each that still need working out.

Eastbourne,
January, 1919.

NOTES AND OBSERVATIONS.

NOTES ON A MODIFICATION OF *LIMENITIS SIBYLLA*, AB. *NIGRINA*, ETC.—I took a specimen of *L. sibylla* approaching ab. *nigrina* in the Forest on July 13th, 1918, and from the footnote to Mr. Pilleau's article ('Entomologist,' li, p. 270) I imagine it to be similar to the specimens there referred to. On the upper side the white markings, though not entirely absent, are very faint and suffused, more especially on the lower wings. The under-side does not altogether coincide with ab. *nigrina* as figured [in] South's 'Butterflies of the British Isles.' At the same time it is not in the least typical, and the general characteristics are more like those of *nigrina*. The trace of white on the margins is present, as it is in both *nigrina* and the type. I found *Zygaea meliloti* swarming in its old haunt, but was not fortunate enough to obtain any varieties of *Dryas paphia* or *Argynnis cyriape*, though I visited the forest on three occasions. In the neighbourhood of Poole I took three specimens of *Dasychira fasciata* resting on heather.—ARTHUR BLISS (Lieut.); 5, Beecherot Mansions, Streatham, S.W. 16.

PLUTIA MONETA.—Mr. Thurnall ('Entomologist,' li, p. 214) may be interested to know of the following records for this species: Woodford ('Entomologist,' xxviii, p. 310), 1893; Buckhurst Hill ('Essex Naturalist,' xiv, p. 136), 1905; and I have taken or seen it in one or more stages in my garden here on monkshood and larkspur every year since 1905. In 1918 I may say I found the species unusually common, and took over two dozen cocoons, besides about a dozen larvae, from three or four plants of delphinium and one of aconitum. I also found two cocoons which had been opened by

great tits and the pupæ eaten ; in one of these cases the cocoon had been spun on a leaflet of the Japanese anemone, and the bird had torn the part holding the cocoon right off and carried it to a distance of three yards, where I found it on the ground. Has not this species been taken in North Wales, Scotland, Ireland, or the Isle of Man ?—C. NICHOLSON ; 35, The Avenue, Hale End, E. 4, January 5th, 1919.

SUGARING.—Referring to Mr. Mayor's remarks ('Entomologist,' li, p. 188) on this subject, may I commend to his notice a paragraph by Mr. Adye in the 'Entomologist,' xx, p. 66, and my account of an autumnal holiday in the New Forest in the 'Ent. Record,' iv, pp. 10, 11. Mr. Adye recommends collectors to try windy nights for sugaring, and I found the best night of my stay was September 27th, when it was so windy that moths were nearly blown off the more exposed trees. On the following evening, after a rainy afternoon, everything was reeking wet when I set out for the sugaring-ground about 6 p.m., a thick white mist came up, the moon soon shone on some of the trees and the air was decidedly chilly, yet moths were in considerable numbers on the treacle. I remember also in my young days treacling a row of elm trees in a field at Clapton (Middlesex) and getting nothing but crowds of wasted *N. xanthographa*, which came to every tree although the moon was shining brightly at the time, in some cases full on the treacle patches ! To the best of my recollection I have rarely used anything but common black (green) treacle, to which a little rum and a few drops of essence of jargonelle had been added, and, I suppose, have had as varied results as most collectors. I have gone home mothless on (apparently) perfect nights and done well on occasions when the weather was everything except ideal, and I have come to the conclusion that where flowers, honeydew or some other opposition attraction do not obviously enter into the question the regulating factor is not "weather," as commonly understood, but something more subtle, such as the electric condition of the atmosphere. I have treacled in a warm rain and had no luck, but I cannot call to mind ever having tried my luck in a thunderstorm, although I have often observed the apparently exceptional activity of moths on thundery evenings, both before and during the storm.—C. NICHOLSON ; 35, The Avenue, Hale End, E. 4.

PECILOCAMPA POPULI AND OTHER MOTHS AT ELECTRIC LIGHT.—During a walk around the hospital just after dark on November 24th, 1918, I saw a number of moths resting upon a post situated under the beam of light from an ordinary electric globe, which was situated upon the outskirts of a group of huts facing the Moors. Upon close examination they proved to be ten fine specimens of *P. populi*, two of them being females. With these were numerous males of *Hybernia defoliaria*, *H. aurantiaria*, and *Cheimatobia brumata*.—CORPL. HUNT, Microscopist, Attached A.V.C. ; Longmoor, Hants.

LEPIDOPTERA OF THE HIGHLANDS OF SCOTLAND.—I am at present trying to find out exactly what species of Lepidoptera have ever been recorded from the Highlands of Scotland. This implies any locality north of a line passing south of Arran, and through Dumbarton, Perth,

and Aberdeen. I would be very grateful, then, if any collector would let me know of any captures or old records he can, referring to the following insects in the above-mentioned "district," viz. *A. sylvanus*, *S. ligustris*, *lironica*, *nerii*, *fuciformis*, *chatonia*, *trimacula*, *trepida*, *derasa*, *diuta*, *cetoestima*, *similis*, *salicis*, *confusalis*, *griseola*, *tridens*, *puta*, *lunigera*, *ripa*, *obelisca*, *obscura*, *lichenata*, *cervuleocephala*, *trifolii*, *hepatica*, *elyptis*, *munda*, *epima*, *triplasta*, *tarsipennalis*, *costastrigalis*, *notha*, *laetaria*, *marginepunctata*, *viretata*, *associata*, *albicillata*, *bifasciata*, *flavofasciata*, *succenturiata*, *virgaureata*, *trisignaria*, *abruptaria*, *crepuscularia*, *clathrata*, *apiformis*, *myopeformis*. I already know of the Morayshire records of *griseola*, *lunigera*, and *notha*.—D. J. GORDON; 3, Northumberland Street, Edinburgh.

PALPARES LIBELLULOIDES, LINN. (NEUROPTERA).—I observed and caught this Neuropteran frequently in the Struma Valley, but, curiously enough, always on the foot-hills and never on the plain itself. My first observation was early in July, 1916, when hundreds of specimens of both sexes were flying above a large area of rank grass at Dodolah, just outside Salonica. In 1917 my first observation was in April (about the 6th), when I netted six specimens on the mountain side below Kajali. The numbers in flight increased rapidly until half-way through May, when they fell off.—W. H. FOULKS (Lieut.); Derby.

STAUROPS FAGI IMAGO IN DECEMBER.—Owing to the continuous high temperature prevailing during November and December, I found a male *S. fagi* had emerged at some date between December 16th and 18th. As it was confined in a small box development of the wings was impossible, but it was perfectly normal in other respects, and was quite vigorous and healthy and lived five days. It would be interesting to know if other collectors have had similar experience with this species.—LEONARD TATCHELL; Wanstead, December 30th, 1918.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, October 2nd, 1918.—Dr. C. J. Gahan, M.A., D.Sc., President, in the Chair.—Dr. Chapman exhibited a bred specimen of *Lycæna alcon*, probably the first specimen that has been bred, certainly the first from larvæ taken in the autumn. Mr. Domisthorpe exhibited a specimen of the common Cockroach (*Bottia orientalis*), taken under bark of oak in the New Forest, far away from any houses, July 29th, 1918. Also a curious ergotian tritomorph of *M. uliginosus* taken on Bloxworth Heath, from the collection of the Late Rev. O. Pickard-Cambridge.—Mr. Hugh Main exhibited the three larval skins of *Dytiscus marginalis*, prepared for demonstration purposes. The following paper was read, the author illustrating his subject with photographs shown in the epidiascope: "Notes on Australian Sawflies, especially 'Authors' Types' and the Specimens in the British Museum of Natural History and the Hope Collection in the Oxford University Museum, with Diagnostic Synopses of the Genera and Species," by the Rev. F. D. Morice, M.A., F.E.S.

Wednesday, October 16th, 1918.—Dr. S. A. Neave, M.A., D.Sc., F.Z.S., Vice-President, in the Chair.—Mr. E. E. Green exhibited specimens of a rare Coccid (*Kermes quercus*) taken on the stem of a single oak, at Selby (Yorkshire).—Mr. W. G. Sheldon exhibited specimens of *Eupithecia helveticata* var. *arceuthata*, Frey, and a living larva from Surrey.—Mr. W. J. Kaye exhibited a remarkable new form of *Heliconius erato* for which he proposed the name *extrema*. It formed a connecting link between *H. erato chestertoni* and *H. erato columbina*.—Mr. Hugh Main exhibited as transparencies in the epidiascope the larval skins of *Dytiscus marginalis*, which had been handed round at the meeting on October 2nd.

Wednesday, November 6th, 1918, Special Meeting.—Dr. C. J. Gahan, M.A., D.Sc., President, in the Chair.—The Treasurer formally proposed to delete Clause 5 of Ch. viii, and to substitute—"The Council shall nominate a chartered or incorporated accountant annually, who shall audit the Treasurer's accounts. The Auditor shall be paid for his services a fee, the amount of which shall be agreed by the Council on behalf of the Society. The Treasurer shall furnish the Accountant with all the facilities he may require for auditing the accounts."—The Treasurer having fully explained his reasons for proposing this alteration, it was seconded by Dr. Chapman and carried *nem. con.*

Ordinary Meeting.—The Rev. Father O'Neil, S.J., Salisbury, Rhodesia; Messrs. Ernest William Nimmy, 210, Whippendell Road, Watford, Herts; R. Stanway Parris, 6, High Street, Bishop's Stortford; the Rev. Alfred T. Stiff, Grantham, Victor Drive, Leigh-on-Sea; Capt. William Henry Tapp, F.R.A.S., F.R.G.S., and Mrs. Eleanor Eva Tapp, of Loos, 88, Wickham Way, Beckenham, Kent; and the Rev. E. Adrian Woodruffe-Peacock, F.L.S., F.G.S., Cadney Vicarage, Brigg, Lincolnshire, were elected Fellows of the Society.—Mr. Lucas exhibited Orthoptera from Salonica, sent by Mr. P. J. Barraud.—The President exhibited a Chalcid, *Torymus elegans*, Borkh., sent to him by the Rev. E. A. Woodruffe-Peacock, which had emerged from a hawthorn-seed which had passed through the alimentary canal of a blackbird, together with the seed from which it had emerged.—Mr. L. B. Prout, on behalf of Mr. J. J. Joicey, exhibited species of the genus *Castnia* and a mimetic Hesperid. Several of the *Castnias* were new or doubtful forms not yet fully worked out.—The President made further observations on the "Cuckoo-spit" insect.—The following paper was read: "Notes on a Large Heliconine Collection made in French Guiana in 1917, Compared with a Similar Collection made in 1915," by J. J. Joicey, F.E.S., and W. J. Kaye, F.E.S.

Wednesday, November 20th, 1918.—Dr. C. J. Gahan, M.A., D.Sc., President, in the Chair.—Mr. Joseph Herrod-Hempshall, Orchard House, Stockingstone Road, Round Green, Luton, Beds, was elected a Fellow of the Society.—The following list of Fellows nominated by the Council to hold office during the ensuing year was read: President, Comm. James J. Walker, M.A., R.N., F.L.S.; Treasurer, W. G. Sheldon; Secretaries, Rev. George Wheeler, M.A., F.Z.S., Dr. S. A. Neave, M.A., D.Sc., F.Z.S.; Librarian, George Charles Champion, F.Z.S., A.L.S.; other members of Council, E. C. Bedwell, G. T. Bethune-Baker, F.L.S., F.Z.S., Kenneth G. Blair, B.Sc., Malcolm Cameron, M.B., R.N., W. C. Crawley, B.A., J. Hartley

Durrant, Dr. H. Eltringham, M.A., D.Sc., F.Z.S., Dr. C. J. Gahan, M.A., D.Sc., Dr. A. D. Imms, B.A., D.Sc., F.L.S., Dr. G. A. K. Marshall, D.Sc., F.Z.S., Rev. F. D. Morice, M.A., Herbert E. Page.—Mr. Arthur Dicksee exhibited three specimens of a new race of *Morpho eugenia* from Colombia, from which it was hitherto unknown, together with two *Morpho eugenia* from French Guiana, and one *Morpho adonis* from French Guiana, and another from the Lower Amazons, for comparison.—Capt. Purefoy exhibited a score of home-bred *L. arion*, together with their pupa-cases.—Mr. W. J. Kaye exhibited six female *Mechanitis polymnia* from the Berbice River, which all showed a very considerable darkening of the outer half of the hind wing, one in particular having the whole outer half black. Two female *M. polymnia* were also shown from the Potaro River, in Central British Guiana, which were the blackest that had been taken.—The following paper was read: "The Hymenoptera of Fiji," by Rowland E. Turner, F.E.S.

Wednesday, December 4th, 1918.—Dr. C. J. Gahan, M.A., D.Sc., President, in the Chair.—Messrs. Anderson Ferguson, 22, Polworth Gardens, Glasgow, W., George Grace, B.Sc., A.R.C.Sc., Inglenook, Utley, Keighley, Yorks, and P. V. Isaacs, B.A., Assistant Entomologist to the Madras Agricultural College and Research Institute, Coimbatore, India, were elected Fellows of the Society.—Mr. W. J. Lucas exhibited Neuroptera from Salonica, sent to him by Lt. P. J. Barrand in 1916-18.—Dr. F. A. Dixey exhibited specimens of the males and females of *G. epaphia* and *P. sabina*, with outline drawings of their scut-scales, by which they might be distinguished.—Prof. Poulton gave an account of the deeply interesting observations made at Tanga, late German East Africa, on August 5th, 1918, by Mr. W. A. Limborn, in continuation of his S. Nigerian investigations on the relation of the anal tufts to the brands of the hind wings observed and on the scent perceived in a male Danaid butterfly.—Prof. Poulton said that he had received notes from Mr. C. B. Williams from Trinidad, B.W.I., containing a suggested interpretation of the special attacks made by blood-sucking Diptera on newcomers into the Tropics and of their gradual diminution.—Mr. H. Dollman exhibited two series of some thirty specimens each of bred *Charaxes*; they represented two distinct species of the "ethoeclies" group, the one having the ♂ form of *manica*, Trim. (resembling small ♂ *brehmanni*), the other having the ♀ form of *phaeus*, Hew. (resembling small ♂ *brehmanni*).—Lord Rothschild exhibited a series of a local race of *Precis octavia* from Tembora, Bahr-el-Gazal, and drew attention to the extraordinary number of intermediate specimens among the series of the dry-season form—fourteen out of sixteen. He also exhibited a series of wet- and dry-season forms with intermediates of *Precis octavia octavia*, Cram., and *Precis octavia sesana*, Trimen, from West and South Africa respectively, for comparison.—The following paper was read: "Butterfly Vision," by H. Eltringham, M.A., D.Sc., F.E.S. This was illustrated by the author by means of the epidiascope with drawings and photographs.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 24th, 1918.—The decease of Lieut. J. Bateson, who was killed in France, was announced.—Mr. Bowman exhibited a nearly

jet-black *Cymatophora ocularis* from Chingford.—Mr. W. J. Ashdown, *Geotrupes pyrenaeus* from Surrey, with a fine bronze-tinted aberration.—Mr. Curwen, the 'Book of Beautiful Butterflies.'—Rev. G. Wheeler, Rev. A. T. Stiff, Mr. Sperring, Mr. Buckstone, Mr. Leeds, Mr. Frohawk, Mr. Turner, etc., series of *Epinephele tithonus*.—Mr. Wheeler read a paper, "The Variation in *Epinephele tithonus*."

November 14th.—The President in the Chair.—Mr. Clifford Craufurd, of Watford, was elected a member.—Miss G. Lister, President of the Essex Field Club, gave a lecture on "The Mycetozoa," illustrating her remarks with a large number of specimens and coloured drawings of the species representative of the sections and chief genera of the group with a large number of lantern-slides. There was an interesting discussion.

November 28th.—The President in the Chair.—*Annual Exhibition*.—Messrs. E. W. Nimmy, F.E.S., of Watford, and D. C. Johnstone, of Rayleigh, were elected members.—Mr. W. G. Sheldon exhibited a very long series of *Sarrothripus revayana (undulanus)*, including the forms *ramosana*, *stonanus*, *dilutana*, *fusculana*, *ilicana*, *afzelianus*, *lathamianus*, *undulana*, *bifasciana*, etc.—Mr. W. J. Lucas, an album of photographs of well-known entomologists in the field.—Mr. R. South, three aberrations of *Brenthis selene* for Mr. Penn, of Brighton: (1) Melanic, with only traces of the fulvous ground; (2) pale straw-coloured ground; (3) pale buff-coloured ground; also a ragged specimen from the New Forest similar to (1). Mr. South also showed *Epinephele jurtina*: (1) With pale hind wings, ♂; (2) with lower part of fulvous blotch white, ♀; *Tricopteryx polycommata*, for Mr. L. Meadon, two brown suffused specimens, bred; also various species of Coleoptera.—Mr. W. J. Lucas, five species of *Nemopteridae* (Nat. Ord. *Neuroptera*) from the S.E. Mediterranean district, including *Nemoptera sinuata*, *N. bipennis*, *N. coa*, *Lertha barbara*, and *Halter pallida*.—Mr. Hy. J. Turner, series of (1) *Euchloë cardamines* race *turritis* from Cyprus, with ♂ and ♀ examples of the very small ab. *minor*; (2) *Parnassius apollo* race *pumilus* from the Calabrian Mountains, Southern Italy, a very local and small race; (3) *Colias edusa*, the clear yellow form ab. *helicina* from Cyprus, and ab. *helice*, one with orange hind wings; (4) *Satyrus briseis* race *fergana* from Cyprus, with the rich orange-brown ab. *pirata*, together with a very small male from Neu Spondinig; (5) *Satyrus prieuri* from Spain, a species similar to the last, with its parallel ab. *uhagonis*; (6) *Agriades corydon*, the single-brooded species from near Florence, with ab. *albo-lunata*; (7) *Agriades aragonensis*, the double-brooded species from the same ground; (8) *Plebeius agon* race *masseyi*, ♂ and ♀, from Witherslack; (9) *Canonympha tiphon* race *philoxenus* from Witherslack; (10) *Notodontia ziczac*, a second-brood specimen bred in a sleeve in Dr. Chapman's garden at Redhill, July 31st, 1918; (11) *Agriades corydon*, ab. *semisyrapha* and ab. *roystonenis* from Royston, ab. *per-aurantia* and ab. *irregularis obsoleta* from Reigate; (12) *Salebria semirubella (carnella)* from Box Hill with ab. *sanguinella*; (13) examples of *Danaida plexippus* (Asia) and *D. archippus* (America), and called attention to the absolute confusion for the past 150 years in the application of these two names, etc.—Mr. J. H. Carpenter, aberrations of under-sides of *A. corydon*, including many named forms.

—Mr. L. W. Newman: (1) Long series of the Irish form of *Melitaea aurinia* from Tyrone larva; (2) curious *Aglais urticae* and *Argynnis cydippe* (*adippe*) with a sheen; (3) aberrations with bleached forms of *Triphena janthina*; (4) a gynandromorph of *Dryas paphia*, 3 wings = *valesina*, one wing partly ♂ *paphia*; (5) a yellow *Aglais urticae*, bred; (6) long varied series of *A. corydon*, *C. pamphilus*, and *P. phleas*; (4) (5) (6) were on behalf of Mr. Percy Richards.—Mr. R. Adkin: (1) *Argynnis paphia*, an aberration with the marginal wedge-shaped spots enlarged, the submarginal spots much elongated, and other markings intensified; under-side, fore wings with confused markings, hind wing with a large basal, silvery patch; (2) *Peronea variegata*, a bred, varied series.—Mr. L. W. Newman, for Mr. Oliver, aberrations of (1) *A. urticae* from ab. *alba* to ab. *salmonicolor* with ab. *ichnusa*; (2) *Epinephele jurtina*; (3) *Zephyrus betulae* ♀, without the white line under-side; (4) *Argynnis aglaja* bleached and ab. *belisaria*; (5) *A. corydon*, ♂'s, grey, blue and green forms, and many striking forms; (6) *Aricia medon*, yellow spotted; (7) *Celastrina argiolus*, true halved gynandromorph (Sutton Park); etc.—Mr. Newman, for Mr. Sabine, a large collection of *Noctuae*, Ireland, 1918, with a number of racial series and individual aberrations.—Mr. C. H. Williams, aberrations of *A. corydon*, including ab. *albina*, ab. *syrapha*, ab. *marginata*, etc.—Mr. B. W. Adkin, long series to illustrate the variation in (1) *A. paphia*, a gynandromorph ♂ and pale ♀, a dark suffused specimen, a small bred example with hind wings brown beneath, 2 ♂'s, with large white patches, and forms of ab. *valesina*; (2) *Eugonia polychloros*, depth of colour and extent of markings.—Mr. Stanley Edwards, sections of the genus *Euploea* from India and the Malay.—Mr. H. A. Leeds, a large number of individual aberrations of *Pararge aegeria*, *E. jurtina*, *E. tithonus*, *Aphantopus hyperanthus*, *C. pamphilus*, *A. bellargus*, *Polyommatus icarus* (8 phases), *A. corydon* (19 phases), *Aricia medon*, *Thecla pruni*, and *Zephyrus quercus*.—Mr. R. Bowman, *Numeria pulveraria*, second brood, August, 1918, with much deeper markings; and *Chrysophanus phleas* ab. *eleus*, Horsley, August, 1918.—For Mr. Ing, he showed *Arctia caja*, bred series, including one with chocolate brown covering almost the entire fore wings with orange hind wings, emphasised markings, and body largely melanistic.—Mr. F. W. Frohawk: (1) *Brenthis euphrosyne*, showing variation in coalescence of spotting; (2) *Euchloë cardamines*, variation in colour, and size of apical and discoidal markings, etc.; (3) *Chrysophanus dispar*, ♂, symmetrically white-marked wings, bred by Doubleday: (1) 2 *Issoria lathonia*, Colchester, 1918.—Rev. G. Wheeler: *Pararge aegeria* ♀ ab. *mediolugens*, near Guildford, 1918, and *Chrysophanus phleas* ab. *suffusa*, ab. *ceruleo-punctata*, ab. *intermedia*.—Mr. Riches, a series of aberrations of *Abraxas grossulariata* from North London.—Mr. A. A. Buckstone: (1) *Hygrochroa syringaria*, bred series of specimens with abnormal wings, parents, ♂ normal, ♀ deformed; (2) many bleached and teratological specimens, and suggested that much was due to the ill-development of the first pair of limbs, the main prehensors, in the period of wing-expansion.—

(To be continued.)

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NEW SPECIES OF LITHOSIADÆ FROM THE PHILIPPINES.

BY A. E. WILEMAN AND RICHARD SOUTH.

Agylla haighti, sp. n.

♂. Antennæ black, bipectinate; head and thorax purplish-brown; abdomen ochreous yellow. Fore wings purplish-brown, costal streak orange, rather broad on basal three-fourths, narrow on apical fourth. Hind wings ochreous yellow, paler along dorsum. Underside much as above.

♀. Similar to the male, but the frons and collar are orange and the antennæ are finely ciliated.

Expanse, 38 mm. ♂, 42 mm. ♀.

Two specimens of each sex from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.).

One male was captured on December 7th, another male (the type) and two females on November 8th, 1912.

Nearest to *A. collitoides*, Butler.

Cyana luzonica, sp. n.

♂. Antennæ red, ciliated; head and thorax white, tegulæ and patagia edged with scarlet; abdomen white, tuft inclining to greyish. Fore wings white with three black dots, one at end of the cell, and two, colon-like, beyond; basal, antemedial and postmedial lines scarlet, the first two united by a line on the costa, rather oblique, the other slightly sinuous; terminal line scarlet, joined to postmedial just below costa; fringes silky white. Hind wings whitish tinged with reddish except on the dorsal area; fringes silky white. Underside of fore wings scarlet, with a black mark at end of cell and blackish suffusion on the disc; hind wings white tinged with scarlet on costal area; fringes of all wings as above.

♀. Agrees in colour and markings with the male, except that there is only one black dot on the fore wings and this is round; the basal line is not distinct.

Expanse, 22 mm. ♂, 25 mm. ♀.

A male specimen from Sapiangao, December 15th, 1912 (5500 ft.), and a female from Baguio, June 4th, 1912 (5000 ft.).

Both localities are in the subprov. of Benguet, Luzon.

Ilema costalba.

♂. Antennæ with paired bristles at each joint. Head and thorax purplish-brown, frons ochreous; abdomen inclining to greyish-brown, anal tuft ochreous. Fore wings purplish-brown, a white streak along costa tapering on apical fourth; fringes white, tinged with ochreous. Hind wings white suffused with dusky except on dorsal area: fringes white. Underside similar to above, but costal streak of the fore wings obscure on basal half and tinged with ochreous towards the apex.

Expanse, 28 mm.

Three male specimens from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.).

The type taken on December 4th, 1912, and others in November (9th and 16th) of that year.

Comes near *I. corrugata*, Leech.

Eurosia ? costinotata, sp. n.

♀. Head and thorax creamy-white, abdomen grey-brown. Fore wings creamy-white, two black antemedial dots; medial line dusky, sinuous, indistinct, followed by a blackish irregular mark on the costa and a blackish cloud on dorsum; postmedial line curved, indicated by dusky dots; a black dot just beyond end of cell and a blackish trigonate spot on costa before apex: terminal dots black; fringes greyish. Hind wings and underside fuscous grey.

Expanse, 10 mm.

A female specimen, taken on June 30th, 1914, at Kolambungan, subprov. Lanao, Mindanao (sea-level).

Stenugoa inornata.

♂. Antennæ ciliated; head and thorax pale ochreous-brown, abdomen rather darker. Fore wings white tinged with ochreous and flecked with light brown; postmedial line dusky, only distinct on the costa as a blackish-brown spot, turned in under the cell, thence oblique to dorsum; traces of a dusky, wavy, subterminal line. Hind wings whitish. Underside as above, but without markings.

Expanse, 26 mm.

Three female specimens from Haight's Place, captured November 2nd, 7th and 25th, 1912.

Chrysasura literata, sp. n.

♂. Head and thorax black marked with orange-yellow, abdomen black. Fore wings orange-yellow marked with black spots and transverse lines; antemedial and medial lines are almost straight and nearly parallel, postmedial sinuous, united with the medial on the costa; two spots between antemedial and base; two spots between medial and postmedial, the lower resting on the lower sinus of postmedial, three spots on terminal area, that near apex elongate; termen and fringes black. Hind wings hyaline with deep black border, the inner edge of the border diffuse. Underside as above.

♀. Except that it is larger, this sex, in colour and marking, agrees with the male.

Expanse, 15 mm. ♂, 20 mm. ♀.

One example of each sex from Kolambungan, subprov. Lanao, Mindanao (sea-level), 1914, ♂ May 27th, ♀ May 28th.

Nearest to *C. postvitrea*, Roths.

Asura luzonica.

♀. Head, thorax and abdomen pale straw-colour with series of black dots representing irregular antemedial and medial lines, a few other black dots before each series; a black dot at end of the cell, one above and another below; subterminal line black, highly dentate; black dots on terminal area; fringes of the ground-colour. Hind wings whitish. Underside agrees with upper in colour, but marking on fore wings very faint.

Expanse, 20 mm. (type), 22 mm. (cotype).

Two female specimens, Palali, subprov. Benguet, Luzon (2000 ft.), November 28th (type) and December 28th, 1912.

Near *A. obliquilinea*, Swinh.

(To be continued.)

GLEANINGS FROM MY NOTEBOOKS—V.

By J. W. HESLOP HARRISON, D.Sc.

Callophrys rubi, L. Strange to say, this "Hairstreak," so very plentiful in Cleveland, has never been found in Durham and Northumberland, although I once found a pupa under a log in West Allendale in the latter county possibly referable to the species. In Cleveland it occurs within sight of Durham on Eston Moor. It is probably absent from none of the moors; I have seen it in profusion in the Great Hograh Ravine which strikes out from Basedale, and in less quantity, although still plentiful, in the pine-wood on Court Moor and everywhere on Great Ayton Moor. With us the larvæ feed on *Vaccinium myrtillus* and *V. vitis-idaea*.

Aphantopus hyperanthus, L. Now almost certainly extinct in Northumberland, Durham and Cleveland. The last local specimens I have heard of were taken at Bradford, Northumberland, in 1884. I took it myself at Castle Howard, Yorkshire, south of the Clevelands, in 1902, fluttering about grassy rides in the woods. Elsewhere I have encountered it in dampish meadows at many points in Co. Tyrone, Ireland.

Aricia medon, Hüfn. This species, with all its many forms, was common enough on the Durham coast when I last visited it in 1914, and I have heard from friends, who have been rash enough to go for it since, that they "saw" it before their operations were ended by "forces beyond their control." Very likely it will have benefited greatly from its four years' immunity.

I visited its Fifeshire haunts in 1913, but apparently its numbers had greatly diminished; still, I got all of the usual forms—*artaxerxes*, *salmacis*, *quadripunctata* and *semiallous*.

Gonepteryx rhamni, L. In the north, as both species of *Rhamnus* are exceptionally rare, this insect cannot gain any substantial footing; at Great Ayton, Cleveland, near Roseberry Topping, where *R. cathartica* is actually indigenous, the insect was obtainable a year or two ago, and I got a female, which was captured drying its wings.

Endromis versicolor, L. Quite common on the small birches on the outskirts of the wood on Culbin Sands, and to be found also on isolated birches scattered throughout the sandhills; also found freely enough on the alders along the old bed of the Findhorn close by. I once beat fourteen larvæ out at one stroke of the stick.

Parasemia plantaginis, L. Obtainable both as larva and imago on all of the Cleveland moors, but probably in greatest profusion near Goathland; the variety *hospita* also occurs. Larvae plentiful on the sea-coast near Warkworth, Northumberland. The males can be obtained in plenty as they fly wildly over the heather on the top of Fair Head, Antrim, Ireland.

Anchoecia pistacia, F. Restricted to England as far north as Yorkshire, according to Meyrick; despite this, I can record it as everywhere plentiful in North Durham. I saw two picked off adjacent trees on the roadside at Birtley on October 23rd by a friend who certainly had no idea of looking for them, and I disturbed others the same day myself.

Anchoecia lunosa. Not plentiful anywhere with us. I have seen Cleveland examples, and observed one on a letter-box at Birtley, Durham, on October 16th.

Othisia maculenta, Hb. Wide-spread with us, and only included because I believe it to be a general feeder in spite of its reputation. I find it in numbers, as it dries its wings under the pines and larches in Wilton Woods, Cleveland. The only possible food-plants there are *Pinus sylvestris*, *Larix decidua*, *Oxalis acetosella*, *Rumex acetosella*, *Deschampsia flexuosa*, *Pteris aquilina* and *Lastrea*.

Miana literosa, Haw. In multitudes at sugar on posts crossing Birtley Fed, including very fine melanic forms; only types at Forres on ragwort and at sugar.

Aeronycta montanthidis, View. Not really rare on the fells and moors in the northern counties. I have observed the imago sitting on the dry stone dykes striking across such areas as well as on the stumps in clearings in the pine woods of the Cleveland Hills. The larva feeds on heather generally, but I have seen it on *Hypericum pulchrum* on Dryburn, West Allendale, Northumberland, and on *Myrica gale* both in Stirling and in Derry.

Plusia iota, L., and *P. pulchrina*, Haw. Both of these species

abound in our counties, and I find them equally numerous in Stirling, Inverness and Elgin, and likewise at Ballycastle in Antrim and Cookstown, Co. Tyrone.

Piusia interrogationis, L. Common enough in the Cleveland, both as larva and imago, on heather; more sparingly on Whitfield Fell, Northumberland.

Eupithecia lariciata, Frv. Present in every well-established larch-wood in all of these counties; similarly distributed in all the larch-woods in Scotland I have worked in Argyleshire, Dumbarton, Elgin and Ross. Chiefly included here, because I have taken it in vice-county 68, from which it had not been previously reported; I beat larvæ from larch near Spindalestone and Bamburgh.

Eupithecia assimilata, Gn. Rare enough in Durham to warrant the recording of a single example in the garden at Birtley.

Melanippe tristata, L. Of general occurrence with us on the outskirts of pine and other woods on the moors and other sub-alpine regions wherever there is a free growth of *Galium saxatile*; rarely, if ever, to be found, even when that plant abounds, lower than 600 ft. in Durham, Northumberland, and North Yorkshire. It occurs freely, however, in Altyre Woods, Forres, only a few feet above sea-level. Flying readily by day it can easily be netted as one startles it off the dry stone dykes and the pine trunks. Suffused forms are not uncommon throughout its range.

Melanippe galiata, Hb. Leaden forms are (or were) not rare on Birtley Fell, which has now been ploughed up, and produces about two grains of oats to the acre.

Melanippe unangulata, Hw. A single specimen at Black Hall Rocks.

Ephyra pendularia, Cl. Fairly common as larva on birches near Forres and Kippen—almost certainly only single-brooded.

Acidalia fumata, Stph. Common enough amongst various grasses in dampish spots on the Cleveland moors, obviously preferring various *Aira* species; in similar spots amongst the heather on Culbin Sands.

Phigalia pedaria. Common and varying little in Northumberland and Durham; of all shades from unicolorous black and chocolate down to pale straw in the pine and birch woods of the Cleveland moors and there abounding. It prefers oak and elm on the lowlands and larch in its higher haunts. It is to be noted, however, that the pure black form made its appearance first in the birch woods.

COLLECTING AT RANNOCH IN 1918.

By F. G. WHITTLE.

I HAD the good fortune to be again in the Rannoch district in 1918. I fixed my quarters at Camghouran, just west of the Black Wood, and had a tolerable amount of success, though I missed, as in 1917, some of the more desirable species for which Rannoch is famous. Moors and hill-sides, where the heather had been burnt, sheltered among the charred sticks, or possessed a certain attraction for, various species of the genus *Peronea*. In the neighbourhood of such patches *mirtana* was abundant and in good condition: *lipsiana*, *hastiana*, *maccana* and *rufana* in much smaller numbers; *ferrugana* in scores, but the interesting range of variation shown was entirely due to the amount of weathering they had undergone, the August emergence—from which I had expected much—showing less variation than would a similar number of south-east Essex specimens. *Depressaria ciniflonella* was frequently turning up, and *Monima incerta*, brown-grey, slaty-grey and red-brown forms, occurred on tree-trunks. *Gelechia junctella* was found at the foot of a birch in the Black Wood on April 16th, and a few were netted flying over a lichen- and moss-studded stone wall by the road-side. *Retinia posticella* was found, as pupae, in the lateral, low-down buds of young trees of *Pinus sylvestris*. This was on April 26th, the few moths bred commencing to emerge on May 26th. On April 22nd *Xenolechia othiops* first appeared flying over charred heather. *Endromis versicolor* was out on the 23rd, and was not difficult to obtain by examining alder and birch by the loch-side. I think I saw more of this species by the Camghouran burn than elsewhere. One freshly emerged ♀ which I found on ling attracted several ♂♂. On April 26th I got my first specimen of *Eriopsela ericetana* flying over a moor, where there was plenty of birch, heath and vaccinium, but no aspen. I took two other specimens between that date and May 20th, close to the Camghouran burn, where there is plenty of vaccinium and several nice aspens. I note that that E. R. Banks ('E.M.M.', 1910, pp. 110-114) gives June 15th as the date of the first appearance of this moth at Aviemore, and June 28th as that of the last. A few larvae of *Euceratagrotis agathina* were picked up on April 27th. *Coccyx strobulella* emerged freely from spruce cones May 16th, and an example of that very brilliant beetle *Carabus nitens* was picked up by a neighbour and kindly presented to me. *Nepticula myrtillella* was flying over vaccinium near Cross Craig on the 20th. On the 31st, on the slope above the farm at Camghouran, *Nepticula sorbi*, *Phylloporia bistrigella* and *Lithocolletis vacciniella* were taken. *Lastorampa quercus* var. *callunæ* ♀ emerged on June 1st. I exposed her on my window-sill, and, the conditions being favourable, she received a good many visitors.

On the 2nd I took a *Nemophora* with broader wings than has *schwarziella* and a whitish face. This ought to be *pilella*, but as it is in wasted condition there is some little doubt about the identification. *Blabophanes wearerella* was quite common at dusk. It seemed equally at home flying over bogs or high ground among young pines. I saw no evidence that it was specially attached to ants' nests. I suspect that, like its very near relative *rusticella*, any accumulation of rubbish might attract it. On June 5th *Phoxopteryx biareuana* was netted very sparingly; on the 9th, on the good collecting ground behind the farm, I got a few *Ornix scoticella* out of *Pyrus aucuparia*. *Coccyx cosmophorana* was netted in the Black Wood on the 11th, and *Ornix loganella* was taken on the 12th at the road-side close to Cross Craig Cottage. There are a few nice spruces, some well-grown birches and rhododendrons in front of this hunting-lodge, and just near, by the side of the burn, a good show of *Prunus padus*. This should be a capital place for evening work. On the 16th, on the slope above the farm, *Lithocolletis corylifoliella* var. *culedoniella* was taken. *Gymnacula fusca* occurred at the same spot, flying over charred heather on the 17th, also *Gelechia boreella*.* *Coleophora juncicolella* was found, making short flights among the heather on the 18th; on the 19th *Monochroa tenebrella* was common at the roadsides where there is plenty of dock, and also of *Centaurea*. This insect is so like *Coleophora aleyronipennella* that I at first thought it must be attached to the knapweed. *Penthina sauciana* (two only) occurred by the loch-side, where the butterfly orchis is to be found, close to the small stone-enclosed cemetery where so many departed Camerons are sleeping their last sleep. *Argyresthia glauccinella*, a quite unexpected capture, was made on the 20th; on the 25th, on the fine collecting-ground behind the farm, *Myrmecozela ochraceella* and *Gelechia obscurella*. This was a great day, for it brought to Camghouran the Rev. Jno. W. Metcalfe, whose success as a field lepidopterist is equalled only by the skill with which he differentiates closely allied species by their genitalia. His admirable description of Camghouran and our various excursions is given in the December number of the 'Entomologist.'

On July 22nd, when crossing Meall à Bhobuir, I disturbed an example of *Tortrix viridana*—quite as unlooked for a capture as that of *Argyresthia glauccinella*. On July 28th *Carsia paludata* occurred in moderate numbers, and *Erebia aethiops* made its first appearance on the 31st. There is, close to the Camghouran burn, a spot such as is described by Mr. Haggart in South's 'Butterflies.' Here, during the first week in August, this butterfly was common; also in open grassy places at the back of the Black Wood. They show the usual amount of variation in the numbers and position of the ocellated spots. *Crocallis elinguaria*, a pale

* I am indebted to Mr. Meyrick for the name of this insect.

yellow silky form, with the usual central band obsolete, and a dark brown form, with well-marked central band, occurred, sitting on low growth. *Hyponomeuta eronymella* was beaten out of aspen on August 3rd. There was plenty of *Prunus padus* close at hand. I received on the 13th from a neighbour a fine *Sirex gigas* ♀. *Eupithecia sobrinata* was plentiful in the Black Wood on the 15th. I worked the junipers here on several occasions, but with very poor results. On the 19th, a sunny day, *Cerapteryx graminis* was freely on the wing. *Cortyna leucostigma* occurred on the farm, and many larvae of *Acronycta euphorbiæ* were obtained from Myrica. On the 23rd *Amathes iners* was not uncommon at rest in the daytime on birch-trunks at Finnart, and *Acanthocinus aedilis*, that prized Rannoch Longicorn, was found on a fence.

I hope these notes, with dates of first appearance of the various species, will prove useful to such of your readers who may have in view a visit to this very beautiful part of Perthshire.

7, Marine Avenue,
Southend-on-Sea.

BRITISH NEUROPTERA IN 1917, AND 1918.

By W. J. LUCAS, B.A., F.E.S.

ALDERFLIES (1917). *Sialis lutaria*, Linn.: For the Lancashire and Cheshire Fauna Record I received one example (T. A. Coward) taken at Rostherne in Cheshire, June 16th, 1917, and a battered specimen from Accrington in Lancashire, undated, but sent by W. R. Eastwood in January, 1918. Two males were captured near Teddington Lock, Surrey, on May 20th, while they were numerous at Byfleet Canal, Surrey, on the 29th of the same month (W. J. L.). One was taken at Brockley Hill, Middlesex, on May 31st (R. South). (1918) This insect was met with at Friday Street on May 20th by the side of the pond in this picturesque Surrey village (L. C. E. Balecomb): two were noticed on palings by the pond in the clutches of spiders.

BROWN LACEWINGS (1917). *Osmylus chrysops*, Linn.: For this, the largest of our Neuroptera, I have only one or two late dates in the New Forest. On July 28th one was taken at Blackwater, and no doubt others were seen, while the same day another was taken in the same district, but not by the stream (W. J. L.). *Hemerobius inconspicuus*, McLach., and *H. nitidulus*, Fabr., were found early in the summer within three or four miles of King's Lynn (E. A. Atmore). *H. lutescens*, Fabr.: One was sent to me, captured by G. T. Lyle at Gog Magog Hills, Cambridgeshire, on July 9th. [*H. subnebulosus*, Steph. : One at Darwen, in Lancashire, June 1st, 1916 (S. G. Birks), sent for the

Lanc. and Ches. Record.] *H. stigma*, Steph.: This early species was taken on the wing in the Oxshott district, Surrey, on March 11th (W. J. L.). *Micromus paganus*, Linn.: G. T. Lyle sent me one, which he found in grass near Cambridge on the evening of June 6th. *M. variegatus*, Fabr.: One was taken at Sudbury, in Suffolk, on August 31st (B. S. Harwood). (1918) *O. chrysops*: One was taken on the wing at Blackwater, in the New Forest, on July 30th, and another was seen in the same locality on August 7th. South had found the species plentiful in the Forest earlier in the summer. South also took in the New Forest in June *H. nitidulus*, one; *H. stigma*, several; and *H. concinnus*, Steph., one.

GREEN LACEWINGS (1917). *Chrysopa flava*, Scop.: For the Lanc. and Ches. Record a very poor specimen was sent for inspection in January, 1918, by W. R. Eastwood. An example was taken from an oak fence at the Home Park, Hampton Court, Middlesex, on June 3rd (W. J. L.). E. A. Atmore sent me a nice specimen of *C. dorsalis*, Burm., taken on June 20th, one of the only two he had taken so far in 1917. In his letter he said: "Mr. B. Harwood tells me he has met with *C. dorsalis* in Suffolk this year. It is a distinct and very pretty species, and a particularly active one on the wing. In the latter respect its contrast to the slower-moving *C. perla* is great." *Nothochrysa capitata*, Fabr.: One was taken in the New Forest on June 14th (R. South), and three within three or four miles from King's Lynn during the summer (E. A. Atmore). (1918) Two *C. septem-punctata*, Wesm., were taken from a fence in Kingston-on-Thames on the evening of May 25th (W. J. L.)

SCORPION-FLIES (1917). For this season the first scorpion fly seen was a male *Panorpa germanica*, Linn., which was taken in Ermyn Street on May 26th. On the 9th of the following month a number of *Panorpas* were seen between Martyr's Green and Effingham Station, three netted all being females of *P. germanica*. Another female of the same species was captured at Hatchford on the same day. On June 17th a male *P. germanica* was taken near Mickleham, and a female *P. communis*, Linn., at Norbury Park. On June 23rd *Panorpas* were numerous between Oxshott and Epsom Common. All examined appeared to be *P. germanica*, and a male and a female of that species were taken along the Oxshott-Leatherhead road. All these were in Surrey, and were due to L. Balcomb or myself.

On June 17th E. A. C. Stowell wrote saying that *Panorpas* were abundant near Marlborough, in Wilts. On June 14th he took at West Wood in that district, and sent to me, a female *Panorpa* which bore a strong resemblance to the scarce *P. cognata*, Ramb. A week or two later he sent me a similar female from Marlborough. In July I received from him at last a male resembling these, as well as a *P. germanica* and an undoubted

P. communis. In August he sent me four *Panorpas*, an almost immaeulate male *P. germanica*, and three larger ones—a female with wing-tips almost unspotted as in the earlier specimens, and a male and a female, which I presume must all be considered *P. communis*, as the anal appendages of the male agree with those of the last-named species. All four were taken at West Wood on August 13th. On the 28th of the same month Stowell sent me two further females of *P. communis*, more or less normal in wing markings. This form of *P. communis* in which the spots on each wing lie chiefly in a single band or narrow fascia is a very distinct one, and if it were not that the genital arrangements resemble those of *P. communis* one would think it a separate species. It is, however, a very interesting form of *P. communis*, which I pro-

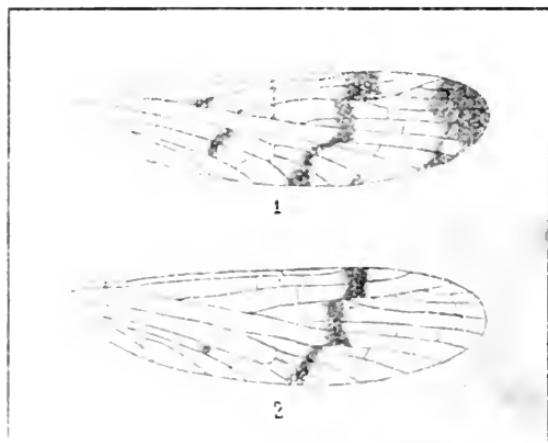


Fig. 1. Right fore wing of fairly typical ♂ *P. communis* ($\times 4$).
Fig. 2. Right fore wing of var. *unifasciata* ♂ ($\times 4$). The specimen figured is the most distinct example of this form that I received.

pose to call var. *unifasciata*. Although I have seen and taken a great number of examples of *P. communis*, I can recall but one like this form, though some others approach it to a certain extent. The specimen referred to was taken at Castle Howard, in Yorkshire, and is figured in the 'Entomologist' for 1910, pl. iv, fig. 1c.

Two males of *P. communis* were captured at Gog Magog Hills on July 9th (G. T. Lyle). On August 2nd I took a female *P. germanica*, and on August 9th another, both in the New Forest. Still later in the season, August 26th, on recent sugar-patches in the Forest, I found two females of *P. communis* and one female of *P. germanica*: they were there to feed on the sugar, no doubt. The next day, August 27th, I caught yet another *P. communis*, a male, in the Forest.

(1918) A female *P. germanica* was taken near Horsley,

Surrey, on June 15th (W. J. Ashdown), while I captured a male *P. communis* in the New Forest on August 16th. On August 25th G. T. Lyle took a *Panorpa* at Fleam Dyke, near Cambridge, and sent it to me. Although a female, there is no doubt that it belongs to the scarce species *P. cognata*. It is to be hoped that he will succeed in securing males during the coming season. Lyle says he has found *P. communis* and *P. germanica* also, but sparingly, at Cambridge.

Kingston-on-Thames,
February, 1919.

HYMENOPTERA AND DIPTERA OF A KENTISH SALT-MARSH.

BY MAJOR R. B. ROBERTSON.

I HAVE been stationed at Oare Camp, near Faversham, for a little over a year, and have worked the salt-marshes bordering Oare Creek and west bank of River Swale on every available opportunity. The land all round is cut up by dykes, in which grow various reeds and sedges, the flowers of which are most attractive to Diptera and Hymenoptera. *Nonagria geminipuncta* pupæ were common in the reeds, and they produced rather dark imagines, but not so dark as those obtained at Christchurch some years ago. *Adopœa lineola* was in the greatest abundance, and although I saw thousands I never came across a variety. The marshes are covered with sea lavender and other plants, and nests of *Malacosoma castrensis* were very common, seeming to eat everything impartially. *Bennetii* was also often disturbed from the *Statice*. I was of course unable to use a lantern or work the marshes at all by night; but I should say one would be well repaid in doing so. I don't think I have ever seen a place so devoid of butterflies, only about twenty species being noted, viz. *P. brassicæ*, *P. napi*, *P. rapæ*, *G. rhamni*, *A. urticæ*, *V. io*, *E. polychloros*, *P. atalanta*, *P. cardui*, *E. jurtina*, *E. tithonus*, *C. pamphilus*, *P. phleas*, one rather nice var. with silver blotch, *A. medon*, very fine, *P. icarus*, *H. malvae*, *N. tages*, *A. sylvanus*, and *A. lineola*. I did not explore the woods much as I wanted to devote all my time to Diptera, aculeate Hymenoptera, and sawflies, a list of which is appended. I came across the burrows of *Andrena cineraria* in the precincts of the camp, and the parasite *Nomada lathburiana* was fairly common, but only two or three ♂♂ were taken as I did not observe them in time.

HYMENOPTERA.

Andrena trimmerana, *A. spreta* = *niveata*, *A. cingulata*, *A. spinigera*, *A. wilhella*, *A. clarkella*, *A. dorsata*, *A. fulvicrus*, *A.*

chrysosceles, *A. nana* = *sauundersella*, *A. labialis*, *A. parrula*, *A. albicans*, *A. cineraria*, *A. minutula*, *A. varia*, *A. nitida*. *Eucera longicornis*, *Cilissa leporina*, *Odynerus antilope*, *O. parietum*, *O. pictus*, *O. parietorius*, *O. spinipes*, *Haliclus leucozonius*, *H. minutus*, *H. morio*, *H. xanthopus*, *H. decipiens*, *H. tumulorum*, *H. smethamellas*, *H. villosulus*, *H. cylindricus*, *H. minutissimus*, *Osmia fulviventris*, *O. lenocornelia*, *O. rufula*, *O. cærulescens*, *Megachile centuncularis*, *Pompilus spissus*, *Salius fuscus*, *Psenulus atratulus*, *P. atratus*, *Pristiphora menanoearpa*, *Prosopis communis*, *P. confusa*, *Carloxyx rufescens* var. *umbrina*, *Pemphredon lethifer*, *Colletes daviesana*, *Nomada ruficornis*, *N. fabriciana*, *N. flavoguttata*, *N. bijuga*, *N. lathburiana*, *N. flava*, *N. roberjeotiana*, *N. succineta*, *N. lincola*, *N. ochrostoma*, *Sphecodes rubricundus*, *S. subquadratus*, *S. dimidiatus*, *Oxybelus uniglumis*, *Myrmica scabrinodis*, *Lasius niger*, *L. fuliginosus*, *Dolerus gonager*, *D. nigratus*, *D. haematoxylon*, *Pteronidea dispar*, *Allantus areuatus*, *Teuthredella atra*, *Tenthredopsis coquebertii*, *Rhopogaster fulripes*, *Emphytus vinctus*, *Blenocampa affinis*, *Pachynematus elittellatus*, *Selandria serra*, *Cephus pilosulus*, *C. palipes*, *Allantus marginellus*, etc.

DIPTERA.

Sciara thomae, *Dilophus febrilis*, *Bibio pomonæ*, *B. marci*, *B. hortulanus*, *Anopheles maculipennis*, *Culex annulatus*, *Ptychoptera contaminata*, *Nemotelus notatus*, *Stratiomys furcata*, *Odontomyia tigrina*, *O. ciridula*, *Chloromyia formosa*, *Beris vallata*, *B. chalybeata*, *Hematopota plurialis*, *Atylotus latistriatus*, *Tabanus autumnalis*, *Leptis tringaria*, *Chrysopilus auratus*, *Leptogaster cylindrica*, *Dioclea reinhardi*, *D. baumhaueri*, *D. flavipes*, *Isopogon brevirostris*, *Philonicus albiceps*, *Epitriptus cingulatus*, *Neoitamus cyanurus*, *Bombylius discolor*, *B. major*, *B. minor*, *Therèva nobilitata*, *Empis tessellata*, *E. lirida*, *E. trigramma*, *Hygrocyathus diadema*, *Pacilobothrus nobilitatus*, *Pipiza noctiluca*, *Lixaster metallina*, *Chilosia grossa*, *C. proxima*, *C. cynocephala*, *Platycnirus fulviventris*, *Pyrophaena granditarsa*, *Didea fasciata*, *Catabombia purastri*, *Xanthogramma ornatum*, *X. citrofasciatum*, *Phaonia campestris*, *Volucella bombylans*, *V. inflata*, *Eristalis sepulchralis*, *E. aeneus*, *E. tenax*, *E. intricarius*, *E. arbustorum*, *E. nemorum*, *Mutatropis flora*, *Helophilus trivittatus*, *H. pendulus*, *H. versicolor*, *H. transfiguratus*, *H. rittatns*, *Tropidia sata*, *Xylota segnis*, *Chrysochlamys cuprea*, *Physocephala nigra*, *Myopa testacea*, *Goniistius dirisa*, *Oligeria lateralis*, *Sarcophaga carnaria*, *Tetanocera elata*, *T. cavyleti*, *Elgiva rufula*, *Psila simetaria*, *Ceroxyx omissus*, *Platystoma seminotatum*, *Pephritis miliaria*.

CHALECID.

Smicra sisipes

ABUNDANCE OF LARVÆ OF *PYRAMEIS CARDUI* AT INSTOW, NORTH DEVON.

By PAYMASTER-IN-CHIEF GERVASE F. MATHEW, R.N., F.L.S., F.E.S.

I NOTICED hibernated *P. cardui* on almost every bright day from April 24th, when the first specimen was seen, until late in June, and on June 8th I watched a female while she was busy laying her eggs upon a large plant of the spear-thistle (*Cirsium lanceolatum*) growing on the top of a high bank. On June 20th I thought I would take a look round and see if I could find any larvæ, so hunted about for a likely spot, and eventually came to a rough field on the side of a hill facing south, where a quantity of thistles were growing—chiefly the common field-thistle (*C. arvensis*), but also with them a good many clumps of the spear-thistle—and in a short time I found four small larvæ, apparently about a week or ten days old. These were easily seen, for as soon as they are hatched they settle down on the middle of the upper surface of a leaf and attack the cuticle, making little white blotches, over which they spin a slight web, in which their pellets of black frass become entangled or are purposely fixed by the larvæ. As I could only find these small larvæ I thought it better to postpone any further search for a week or two. However, these four larvæ grew so rapidly I went to the same field again on June 27th, and then found seventeen, some of which were already more than half grown. From this time up to July 7th—the day I took the last—I usually noticed larvæ whenever I was out walking and looked for them both in this neighbourhood and near Bideford. I took eighty altogether, and might have taken many more had I wished to do so. Of course the half- and full-grown larvæ make much larger webs, and some of them draw the tips of the pointed leaves together, mingle them with spines from the calyx or pappus of the plant with bits of frass, and so form a kind of cave, which becomes larger as the larvæ grow, and into which they retire when they are not feeding or when about to change their skins. Others form a sort of pocket just below the calyx. I only noticed the full-, or nearly full-grown larvæ exposed on their food-plant on one or two occasions, so fancy that in a wild state they must feed chiefly at night, although those in confinement were often to be seen feeding by day. Where they go to change to pupæ I do not know, for I was not able to find any attached to the thistles although I searched many scores of plants that had recently been occupied by mature larvæ, but there was no sign of any either upon the stems of the plants or suspended from the under sides of the large lower leaves. I fancy they must wander a considerable distance from their food-plants before finding a suitable place. In confinement they all attached them-

selves to the muslin hoods over their food in the flower-pots in which they were kept.

The parent butterfly when depositing her eggs appears to avoid the extra large plants and selects those of a medium or smaller size, and I did not find any larvae upon large plants of the field-thistle (*C. arvensis*), but only on those stunted specimens growing almost level with the ground, and without erect stems for the larvae to pupate on had they wished to do so. Some years ago in this parish I found several larvae feeding upon fleabane (*L. dysenterica*), and at Malta and elsewhere on the Mediterranean coast have taken them on a dwarfed variety of the common mallow (*M. sylvestris*).

The first butterfly emerged on July 20th, and the last on August 13th, and from the eighty larvae reared seventy-eight butter-flies were bred. Only two pupae produced parasites: from one a number of small flies, somewhat similar in size and appearance to *Apanteles glomeratus* (although I could not see any of the usual little masses of golden cocoons attached to the sides of the breeding-cage); and from the other two or three dark brown flies, a trifle smaller than our common house-fly—so that these larvae were remarkably free from the attacks of ichneumons, etc.

Of the butterflies bred about half were allowed their liberty, and the rest—a very fine series—were set. These do not display any great range of variety, but there are several nice dark examples, with the black apex of fore wings much enlarged and the white spots very small, and with bars and spots of hind wings broader and larger than in typical specimens; they are also more or less suffused with dusky atoms. In addition to these there are two interesting specimens having the outline of their wings much rounded, particularly those of the left side, which are also slightly reduced in size; one of these is rather dark, the other normal.

As the larvae were so plentiful in June and July I fully expected to see a large number of the perfect insects in the late summer, but with the exception of a single fresh one seen on August 11th—and which might have been one of those released—I did not notice any, which was no doubt owing to the excessive amount of rain, and cold, dull, boisterous weather we had throughout the greater part of August and September.

Instow, North Devon;
December 18th, 1918.

LEPIDOPTERA FROM SOUTH NORWAY.

By J. C. HAWKSHAW.

THE insects named in the following list arranged in the order of Staudinger and Rebel's catalogue, 1901, were taken, with a

few exceptions, which are noted, in the neighbourhood of Vigelands Foss, on the Otteraa River, about ten miles from Christiansand, in the south of Norway. About thirteen years ago I bought the Foss and some property adjoining, which has necessitated three or four visits a year to the locality. On these occasions I collected Lepidoptera when I could spare time from other work. I paid little attention to butterflies, but took thirty-two out of the ninety-six given by W. M. Schøyen in his list of those occurring in Norway, and saw two others, *Parnassius apollo*, and *Papilio machaon*, perfect insect and larva, on *Pimpinella saxifraga*. Systematic collecting would, no doubt, add many species to those given in my list.

It will be seen that in many cases I only took in thirteen years one specimen of a species. With regard to this I may say that I never omit to take more than one specimen of an insect met with for the first time, knowing well that it does not follow that I shall see it in the same locality again. *Olethreutes schulziana* was abundant everywhere in the forest in 1907, but, except in that year, I only saw one other specimen.

I should say that individuals are scarce in very many species. Caterpillars also are scarce. The leaves of deciduous trees at Vigeland are mostly entire and untouched by insects. Anyone familiar with the woodlands of the south of England cannot fail to be struck by the perfect condition of the foliage of the Vigeland trees. Bates, when collecting at Para, found "a great paucity of individuals as compared with species," and, he adds, "we rarely saw caterpillars," and comes to the conclusion that "the increase of these creatures was checked by the close persecution of insectivorous animals," but as he also says that the only kind of insect that appeared in great numbers of individuals were ants and termites and certain species of social wasps, I have wondered why he did not also hold ants as responsible for some of the scarcity of individuals in Lepidoptera.

At Vigeland the ant is the dominating insect. Ants exist in countless myriads. I do not think it would be possible to find a branch of a tree that was not travelled over by ants. Ant-hills of very large size abound everywhere, and one has only to see the spoils carried by the armies of ants which cross the footpaths in broad tracks everywhere to realise the destruction of other orders of insects by ants. From the forester's point of view these ants serve a useful purpose by keeping down insect pests, and the natural reproduction of the forest at Vigeland is extraordinarily good.

There is a little cultivated land along the margin of the river; behind it on both sides is a maze of rocky hills rising up from 500 to 600 ft. The tops of these hills of crystalline rock have all been rounded and smoothed by ice, and often now consist of bare rock covered with patches of moss. The surface of this rock in

many places has altered little in form since the ice left it. The surface of the rock is being slowly broken up by vegetation—by Scotch fir principally, that species with spruce and juniper being the only conifers.

The spruce thrives on the rocky talus on the valley sides, but the Scotch fir grows on the rocks, and seedlings may be seen rooted in the smallest cracks in what appears to be solid rock. In the forest the tops of the hills are often smooth, rounded masses of rock covered only by patches of moss—rounded pads which are not attached to the rock, as one may find to one's cost if one sets foot on one carelessly on a slope. On lifting the moss it will be seen that the rock is being disintegrated beneath it, there being numbers of loose detached fragments. As these patches of moss are easily moved and must be frequently displaced by snow or by other effects of climate, the disintegration is distributed over the surface and tends to maintain the smooth, rounded outline. Scotch fir and spruce will occasionally germinate in the pads of moss. I often pass a Scotch fir which is growing on the top of a solid detached block of stone. It has started as a seedling on the top, but the root has travelled 4 or 5 ft. down the back of the block and has rooted in the ground below. Scotch fir will root in the smallest crack, and when it splits the rock the root may be seen to have spread laterally, forming a solid wedge 3 or 4 in. wide. In geological manuals not enough credit is given to vegetation for the work it does in breaking up rocks. I feel sure that more work is being done in south Norway by vegetation than by frost. The deep covering of snow that remains often till late in the spring protects the rock from the effects of frost. To break up solid domes of crystalline rock is not an easy matter, and I do not think water and frost would have much effect without the help of vegetation.

Deciduous trees are found throughout the forest, but they are mostly cut for firewood, and are rarely allowed to reach an age suitable for timber. Birch and aspen are most abundant, with oak, ash, lime, elm, Norway maple, alder (*Alnus glutinosa* and *A. incana*), with *Rhamnus frangula* and hazel. Wild raspberries are abundant in clearings with patches of golden rod and spiraea.

In the forest, which is generally very open, consisting of trees of all ages, the cutting being mostly by selection, there is a thick undergrowth of *Vaccinium myrtillus*, *V. uliginosum* and *V. vitis idaea*, often overrun with *Linnaea borealis*, which makes the air fragrant with its scent. On the higher ground *Empetrum nigrum* and *Arcostaphylos uva-ursi* abound, trailing in matted masses over the rocks. Among the commoner plants of the forest are *Anemone hepatica*, *Coronis succisa*, *Trifolium europea*, *Smilacina bifolia*, *Polygonum vulgaris*, *Melampyrum pratense*, *Menyanthes trifoliata*. *Pyrola media* and *P. rotundifolia* are common,

but the lovely little *Pyrola uniflora* is very local. About the cultivated ground large patches of a brilliant blue *Viola tricolor* are a beautiful sight in spring. Another striking plant for colour is *Lychinis viscaria*.

An arm of the Fjord reaches inland to within three and a half miles of Vigeland. Near it, and also along the river and up some of the valley sides, there are large areas of copse-wood. This is cut for firewood, mostly by selection, and not clear cut as it is in this country.

Lakes, large and small, abound. The smaller ones are being slowly converted by the growth of vegetation round their margins into bogs, which have already taken the place of lakes in many valley bottoms and now cover a large area. In shallow lakes *Lobelia dortmanna* appears above the water over large areas and yellow and white water-lilies grow in the deeper parts. Heather bog myrtle, *Andromeda polifolia*, and rarely Cloudberry grow on the drier part of the bogs, with cotton and other grasses. *Vaccinium oxycoccus*, *Drosera longifolia*, *Viola palustris*, *Pinguicula* and Bog Asphodel are scattered over the sphagnum in the wetter parts.

Among other plants occurring at Vigeland I may mention *Gnaphalium dioica*, *Hypericum elodes*, *Potentilla comarum*, *Caltha palustris*, *Silene nutans*, *Dianthus armeria*, *Gentiana amarella*, *Listera cordata*, *Habenaria bifolia*, *Chrysanthemum bipinnatum*, *Sedum telephium*, *Pimpinella saxifraga* and many others, and of shrubs, the showy *Sambucus racemosa*.

RHOPALOCERA.

PAPILIONIDÆ: *Papilio machaon*, on wing May, larva on *Pimpinella saxifraga*; *Parnassius* (? *apollo*), seen occasionally. *Sedum telephium*, is common and also *Saxifraga aizoides*, food-plant of *P. delius*; *Aporia crataegi*, May, June and July; bred from colony of larva on mountain ash, 1910; a darker shade along margins of wings than my French or Swiss specimens; *Pieris napi*, May and August; *Euchlöe cardamines*, abundant, May and June; *Leptosia sinapis*, end of June; two specimens with dusky tops very faint; *Gonepteryx rhamni*, common.

NYMPHALIDÆ: *Polygona c-album*, bred from larva on hop at Vigeland, and sallow at Voksenkollen; *Euvanessa antiopa*, bred from larva, 1910; colony on sallow.

Melitaea athalia, June and July, 1906; *Brenthis selene*, June and July, 1900, 1906; *B. pales*, var. *arsilache*, July, 1906, July 10th, 1908; *Issoria lathonia*, May 30th, 1905; *Argynnis aglaja*, July, 1900, May, 1909, 1912; *A. niobe*, July 21st, 1900; var. *eris*, July, 1900; *A. cydippe*, July, 1900; *Dryas paphia*, July, 1900, August, 1909.

Erebia aethiops, July, 1910, at Valle in Sætersdal; *E. ligea*, July, 1900, 1910 and 1912, and at Bykle; Sætersdal, July, 1910.

Hipparchia semele, July 23rd, 1905.

Pararge egeria, var. *egerides*, July 8th, 1904, May 30th, 1905; *P. hiera*, June 2nd, 1904, May 30th, 1905, June 25th, July 12th, 1907;

P. mera, July 12th, 1907; *Epinephele jurtina*, July 23rd, 1905, July 7th and 8th, 1906; *Cœnongympha pamphilus*, July, 1900, and 1912.

LYCAENIDÆ: *Callophrys rubi*, May, very small; *Chrysophanus virgaureæ*, June, 1900, July, 1908, August, 1909; *C. phleas*, May and August; *Plebejus argus* (= *argyrogynomon*, Auct.), June, July, and in Sætersdal August; *Vacciniina optilete*, June 21st, 1906, June 7th, 1908; *Celastrina argiolus*, May, 1904, and 1905.

HESPERIIDÆ: *Angiades sylvanus*, July; *Hesperia malve*, May 24th, 1907; *Nisoniades tages*, June 3rd, 1904.

HETEROCHERA.

SPHINGIDÆ: *Hemaris seabiosa*, May 28th, 1905.

NOTODONTIDÆ: *Dicranura vinula*, larva; *Phalera bucephala*, May and June, 1910, bred on alder, smaller and darker than British specimens.

LASIOCAMPIDÆ: *Lasiocampa quercus*, June 28th, 1918, and bred June, 1911.

SATURNIIDÆ: *Saturnia pavonia*, one female just emerged at rest on heather May 21st, 1911.

NOCTUOIDÆ: *Acronycta euphorbiæ*, bred, May, 1907, from larva on sedum; *Agrotis castanea*; *A. triangulum*; *A. c-nigrum*, disturbed in meadow by mowing-machine; *A. saucia*, at light; *Charæas graminis*, at light; *Mamestra dentina*; *Bombycina viminalis*, bred sallow from Holmenkollen, near Christiania; *Diloba ceruleocephala*, bred 1910, larva on apple-trees; *Ammoconia cecimacula*, at light, and bred from larva on *Lychnis viscaria*; *Hydrycia micacea*, September 14th, 1916, worn specimen in Holebal Evje; *Leucania comma*, July 8th, 1912, rest in house, very dark form; *L. lithargyria*, July 20th, 1912, at rest; *Curadrina quadripunctata*, at light; *Rusina umbratica*, at rest in house; *Tenioicampa gothica*, May 14th, 1907; *Scopelosoma satellitia*, bred sallow; *Prothymnia viridaria*; *Euelidia glyphica*; *Pechipogon barbalis*; *Bomolocha fontis*; *Hypena proboscidalis*.

GEOMETRIDÆ: *Geometra papilionaria*; *Thaleria lactearia*; *Acidalia virgularia*; *A. pallidata*; *A. subsericiata*; *A. aversata*; *A. marginepunctata*, fine leaden form; *A. fumata*, common; *Rhodostrophia vibicaria*, var. *strigata*, July 16th, 1912; *Ortholitha limitata*; *Anaitis paludata*, at Bykle, Sætersdal, July 30th, 1910, also at Voksenkollen; *Lobophora carpinata*; *Cheimatobia boreata*, November 29th, 1907, November 2nd, 1909; *Lygris testata* var. *insulicola*, common, and bred from larva on *Potentilla*; *L. populata*, common and variable; *Larentia fulvata*, July 8th, 1901, one only at Christiansand; *L. bicolorata*, July 27th, 1910, only one; *L. variata*; *L. cognata*, at Voksenkollen; *L. truncata*; *L. immanata*; *L. tæniata*; *L. viridaria*, July 5th, 1907, one only; *L. fluctuata*, June 9th, 1904, August 19th, 1909, only two; *L. didymata*, June, July and August common, and in Sætersdal July, 1910, dark and light varieties; *L. vespertaria*; *L. montanata*, June and July abundant, also in July at Voksenkollen, one specimen, approaches Stornoway form; *L. autumnata*, October 26th, 1907, like Rannoch light specimens, but larger; *L. casinata*, very abundant Bykle, in Sætersdal, July 30th, 1910; *L. tristata*, May 29th, 1905, one only; *L. alchemillata*, July 14th,

1907, one only; *L. minorata*, August 4th, 1904, one only; *L. albulata*, very abundant 1905, also at Bykle, July 30th, 1910; *L. oblitterata*, June 29th, 1906, one only; *L. luteata*, common; *L. sordidata*, in Sætersdal, varies much, many dark varieties; *L. autumnalis*, May 29th, 1905, one only; *L. corylata*; *Asthenia candidata*; *Tephroclystia insignata*, *T. pusillata*, *T. indigata*, *T. togata*, *T. absinthiata*, *T. lari-ciata*, *T. castigata*, *T. satyrata*, *T. plumbeolata*, *T. tenuiata*, *T. nanata*, *T. dodoneata*, *T. sobrinata* (Sætersdal, August, 1910); *Chloroclystis rectangulata*; *Abraixas marginata*; *Deilinea pusaria*, bred; *D. exanthemata*, June 25th, 1906, one only; *Numeria pulveraria*; *Selenia bilunaria*, June 1st, 1904, one only; *Gonodontis bidentata*, July, 1908, one specimen; *Crocalis elinguaria*, August 3rd, 1907, one only; *Opis-thograptis luteolata*, June 2nd, 1904, one only; *Epione paralellaria*, August 4th, 1909, one; *Semiothisa signaria*, May 19th, 1911, one; *S. liturata*; *Hybernia marginaria*, November 3rd, 1909, one worn specimen; *Anisopteryx cæsularia*; *Boarmia gemmaria*, August 10th, 1909, one worn specimen; *B. repandata* and var. *sodorensium*, July 15th, 1900, July 5th, 1907, like specimens from Stornoway; *B. bis-tortata*, at rest on trees in May; *B. punctularia*, May, at rest on trees; *Gnophos obscuraria*, July 2nd, 1910, one specimen; *G. myrtillata*, var. *obfuscaria*, July 27th, 1900, one specimen, like Rannoch and Stornoway varieties; *Ematurga atomaria*, abundant, not so dark either male or female as some English examples; *Bupalus piniarius*, common; *Thamnonoma brunneata*, very abundant some years; *Perconia strigilaria*.

ARCTIIDÆ: *Phragmatobia fuliginosa*, July 8th, 1907, one specimen dark underwings; *Diacrisia sanio*; *Nudaria mundana*; *Miltochrista miniata*; *Endrosa irrorella*.

ZYGÆNIDÆ: *Zygæna filipendulæ*; *Ino statices*, very abundant, June, 1906.

PSYCHIDÆ: *Fumea comitella*, bred.

HEPIALIDÆ: *Hepialus hecta*.

PYRALIDÆ: *Crambus inquinatellus*, July and August; *C. tristellus*, July and August; *C. sellasellus*, July and August, abundant, and Sætersdal; *C. perlellus*, July 20th, 1900, and Sætersdal, July 29th, 1900; *C. margaritellus*, July and August, abundant, 1912, and July, 1905, at Voksenkollen; *C. myellus*, July 3rd, 1908, and August 2nd, 1910; *C. falsellus*, abundant July, 1908, and at Bygland, August, 1910; *C. hortuellus*, June and July, common; *C. culmellus*, abundant, July; *C. dumetellus*, July, 1912; *C. pratellus*, abundant, June; *C. alienellus*, end of June, 1906, abundant at Voksenkollen, July 19th, 1907; *C. silvellus*, July 14th, 1900, July 8th, 1912; *C. ericellus*, end of June and July, common; *C. pasuellus*, end of June and July, abundant; *Platytes cerusellus*, June, 1906, very abundant on grassy slopes, on wing at 6 a.m. in bright sun; *Ephæstia elutella*, abundant on wing about house at 10 p.m.; *Aglossa pinguinalis*, June, July and August, common; *Pyralis farinalis*, June and July; *Nymphula nymphæata*, July 12th, 1908, and July 21st, 1912, only 2 specimens seen; *Euryhympara urticata*, July 5th, 1907, only one specimen; *Scoparia cembræ*, June 26th, 1907, only one specimen; *S. ambigualis*, June and July; *S. valesialis*, June, July and August, 1904 and 1909; *S. murana*, July 7th, 1907; *S. resinca*, August 15th, 1909; *S.*

angustea, July 26th, 1910; *Nemophila noctuella*, August 7th, 1905; *Phlyctenodes verticalis*, May, 1905, June and July, 1907, July, 1908; *Pionea prunalis*, July 24th and 25th, 1905, July, 1912; *Pyrausta fuscalis*, July 15th, 1900, one only; *P. cespitalis*, May and July; *P. purpuralis*, July 28th, 1900, June 21st, 1906; *P. nyctemeralis*, July 1st, 1908, July 5th, 1916; *P. funebris*, June 17th and 23rd, 1906, May 31st, 1908, July, 1912.

PTEROPODIDÆ: *Oryptilus pilosellæ*, September 1st, 1904; *O. teucrii*, July and August; *Platyptilia acanthodactyla*, July 4th, 1908, one specimen; *P. tesseradactyla*, June and July; *Pterophorus tephradactylus*, July 11th, 1900, July 19th, 1905, July 15th, 1912; *Stenoptilia zophodactyla*, June and July, 1906, August 8th and 12th, 1909; *S. pterodactyla*, August 6th, 1909.

(To be continued.)

NOTES AND OBSERVATIONS.

HIBERNATION OF *AGLAIS URTICÆ*.—*A. urticae* began to hibernate very early in 1918. Indeed, I do not remember to have seen more than a couple in the garden after the break-up of the summer at the end of August. This was about the third week of October; none appeared in September; and for the first time in my recollection *Pyrameis atlantica* was entirely absent. During the winter I have found several "roosts" of *urticae* in the house; and it is noticeable that, just as the larvae are gregarious, and the pupæ hang up (at any rate in captivity) in close association, so the hibernating imagines appear to cling together for the winter sleep in the cornice angles selected. Probably this has been reported long since, but it has not hitherto come under my own personal observation.—H. ROWLAND-BROWN; Harrow Weald, Middlesex, February 9th, 1919.

A CORRECTION.—In the description of *Fornatopus iridipennis* in the February number, p. 30, l. 38, for "simple, not bordered," read "bordered." E. A. ELLIOTT; 16, Belsize Grove, N.W. 3, February 10th, 1919.

ASTHENIA FIMBRIANA, ETC., IN ESSEX.—I met with *Asthenia fimbriana* in Thorndon Park on March 26th of last year. I had not seen it previously, and think it must be a rather scarce Tortrix in Essex. I have many times collected oak galls in the winter thinking to get this species, but beyond *Asthenia argyrana* (in plenty) and a single larva of *Orioppa gonostigma* they yielded nothing lepidopterous.

E. G. WHITFIELD; 7, Marine Avenue, Southend-on-Sea.

SOLIDAGO VIRGAURIA IN ESSEX.—Gerard's 'Herball' (1636), p. 429, states that "Golden Rod groweth plentifully in a wood by Rayleigh in Essex, hard by a Gentleman's house called Mr. Leonard, dwelling upon Doves Heath." This wood, probably of much smaller extent

than it was in the old herbalist's day, still shelters a nice growth of *Solidago*, on which larvæ of *Eupæcilia subroseana* and *Grapholitha æmulana*—two rather local Tortricæ—are to be found.—F. G. WHITTLE; 7, Marine Avenue, Southend-on-Sea.

Thera simulata HB. AT WOLSINGHAM.—Referring to Dr. J. W. Heslop Harrison's notes, *antea*, pp. 38–41, as to this species at Wolsingham, the following extract from my diary may be of interest. “June 18th, 1881, at Wolsingham. *Thera simulata* larvæ, full fed and very abundant, emerged later in great numbers, whereas larvæ got earlier in previous years did badly.” I can quite well remember that my old friend, the late John Sang of Darlington, was with me upon the occasion, and that along with larvæ of *simulata* we beat out countless numbers of *Eupithecia sobrinata* larvæ as well. Neither favoured the larger bushes, but seemed to frequent the smaller stunted bushes by preference. Wolsingham was a very favourite locality of Mr. Sang's for collecting and he made frequent excursions there.—J. GARDNER; Laurel Lodge, Hart, West Hartlepool.

BIG PRICES AT STEVENS' AUCTION ROOMS.—On Tuesday, February 11th, the modern collection of British Lepidoptera formed by Mr. G. B. Oliver was brought under the hammer, and the various lots realised exceptionally high prices, anything in the nature of a good variety selling readily, and in many cases at far above anything previously thought reasonable. Thus *Argynnis aglaia*, “a magnificent black dusted dwarf female,” made £5 5s.; and a series of eighteen specimens including “several nice forms” with twenty typical *A. adippe*, £8 5s. *A. paphia*, a female heavily marked with black, £14, and another with “coalesced markings,” £5 10s. *Melitæa aurinia* (*artemis*), a unicolorous specimen, brought £5; another somewhat similar, £5 10s.; and a fasciated pair, £4 5s. *Polygonia c-album*, one with rich chocolate underwings, sold for £3 5s.; and a similar, but hardly so intensified, example made £2 5s. Among a large number of more or less interesting forms of *Aglaia urticæ* four var. *alba* ranged from £3 10s. to £3 15s. each; and various forms of the var. with “blackened costæ” and distorted markings from £5 to £6 6s. *Vanessa io*, a fine example of the “blind” form, made £8; and an intermediate, £5. Another £5 lot included a pale-banded *Pyrameis atalanta*; and two nice vars. of *Pararge ægeria* in which the light markings were much extended fetched £5 10s. A remarkable underside form of *Zephyrus betulae* sold for £6 16s. 6d.; a pair of *Thecla pruni* in which the orange mark was sexually reversed, £4; and a *Chrysophanus phœas*, “minus copper band on hind wings,” £2. *Agriades bellargus* (*adonis*) “slatey-grey” males ranged from £2 to £3 3s. a female underside with spotting obsolete on fore wings and striated hind wings ran up to £15 15s. Among a large number of *A. corydon*, a tawny female made £5 5s.; a very complete *obsoleta* male underside, also £5 5s.; and one with all wings striated, again £5 5s.; while for a remarkable specimen in which the left wings were var. *syngrapha* and the right wings peppered and streaked with blue and brown, £13 was paid. Two strongly marked pairs of *Lycæna arion* sold for

£2 5s. and £3 respectively; a fine "hermaphrodite" *Celastrina argiolus*, £11; and a *Nemophius lucina* with "cream ground colour," £1 10s. Among the extinct and migrant species the only *Chrysophaenus dispar* included in the collection, a fairly good female, made £10 10s.; two *Phryxus livornica*, £3 10s. and £2 15s. respectively; and *Daphnis nerii*, £12. *Epicneptera ilicifolia*, two pairs bred from a female taken at Cannock Chase by Mr. Oliver in May, 1913, sold for £6 10s. and £6 per pair, and a lot of three including the original female for £7, while a couple of *Hyloicus pinastri* made £3 apiece. Cabinets also were in demand, a forty-two drawer fetching £43 1s., and a forty-drawer "Brady," £81.—R. A.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. November 28th, 1918 (continued from p. 48).—Mr. H. Moore, *Anosia archippus*, racial forms from areas ranging from Canada to the Argentine.—Rev. J. S. Tarbat, for Mr. Burras: (1) *Dryas paphia*, much coalesced and suffused examples; (2) *A. euphye* (pale); (3) *Phragmatobia fuliginosa* (yellow); (4) *Lithosia deplana* (very dark); (5) *Calymnia trapezma* (extremes of aberration).—Rev. A. T. Stiff: (1) *Amorpha populi*, buff and pink form; (2) *Saturnia pavonia*, with pink marginal band on hind wings; (3) *Arctia villica*, ♀, with confluent spots and hind wings almost devoid of markings; (4) *Arctia caja*, ♂ salmon-pink, ♂ yellow, ♂ pink-yellow and confluent spots, several with dark fore wings; (5) *C. pumphilus*, with extra ocelli below, etc.—Mr. Ashdown, long series of aberrations of *Adalia bipunctata* (Col.).—Dr. T. A. Chapman, *Orygia retusa*, California, a long, variable, bred series with *O. antiqua*, *O. splendula* and *O. auro-limbata* for comparison.—Mr. G. Fryer, *Scodronia fugaria* (*belgariaria*), a melanistic example, and *Polyommatus icarus*, a striated form.—Capt. B. S. Curwen, a number of species of British Fossorial Hymenoptera, including the rare *Methoca ichneumonoides*.—Mr. W. West, for the Society, the Collection of Canadian Lepidoptera.—Mr. L. Tatehell: (1) *Dryas paphia*, with heavy markings; (2) *E. polychloros*, with light under-side; (3) *A. urticae* ab. *polari*, bred; (4) *Agriotes apricina*, typical, melanistic, and ab. *virgata*; (5) the exotic Pierid *Habenora glaucippe*, India, with races *australis*, S. India, *sumatrensis*, *celebensis* and *javanensis*.—Mr. A. W. Buckstone, for Mr. Pugsley, *Plutella cruciferarum*, bred, from wild seakale.—Mr. A. Butterfield, *Teracolus euanthe*, Madagascar, three forms of the ♀, the ♂ and a rare aberration of the ♂, with apical blotch clear lemon-yellow.—Mr. W. J. Kaye, a very fine graduated series of *Helicentrus nelpenome* to show the range of the lines of variation, local, aberrational and developmental, illustrated by the named forms.

December 12th, 1918.—The President in the Chair.—Mr. Ashdown exhibited Neuroptera from the late Mr. C. A. Briggs' collection, including *Perilissus maxima*, *P. cephalotes*, *Chloroperla grammatica*, *Nemoura variegata*, *Isopteryx tripunctata*, etc., and presented them to the

Society's cabinets. He also showed the various species of the Coleopterous genus taken by him in Surrey in 1918.—Mr. R. Adkin, various species of the Tortrices, bred from larvæ feeding on ivy along the parades at Eastbourne, *T. fosterana*, *T. podana*, and *T. pronubana*.—Mr. R. Bowman, *Tephrosia bistortata*, with dark, suffused marginal area.—Mr. Barnett, a very variable series of *Bryophila perla* from Warrington.—Mr. B. W. Adkin, *Dryas paphia*, showing aberration in coloration, marking, size, and shape of wing.—Mr. W. West, the rare Coleopteron, *Amarochara bonnairi*, from Box Hill, not taken since 1863, by Dr. Power.—Mr. H. J. Turner, a long series of the Lycaenid, *Chilades trochylus*, from Cyprus, the smallest species of Rhopalocera; also a series of *Hydrcia crinanensis* from Ireland, with several of the named forms sent him by Mr. Greer.—Mr. A. A. W. Buckstone, several series of *Agriades corydon*, and contributed a note on the dwarf local race taken on the N. Downs during the past two years.—Several members gave notes on the season. *Hibernia defoliaria* had been seen as early as September 23rd in Surrey.

January 9th, 1919.—Mr. Stanley Edwards, F.L.S., F.E.S., President, in the Chair.—Mr. G. H. Cornish, Plumstead Common, was elected a member.—Mr. Buckstone exhibited a series of second-brood *Agriades thetis* from Eastbourne and the Surrey Hills.—Mr. Frohawk: (1) *Plebeius aegon*, very pale examples, with immaculate undersides of fore wings, and slightly striated; (2) *Aricia medon (astrache)*, pale yellow marginal markings; (3) *Polyommatus icarus*, a female with pale yellow marginal markings.—Mr. B. Adkin: (1) *Argynnis aglaja*, pale specimen, with enlarged markings; (2) *A. cydippe (adippe)*, pale specimen, a strongly banded underside; (3) a curious smoky *Strenia clathrata*.—Mr. R. Adkin, two *Hypercallia citrinialis (christiana)* from an old collection.—Mr. H. Main, a species of *Anopheles*, common at Eastbourne, and a series of photographs (enlargements) of details of the life-history of *Gastrophila equi* and *Eristalis tenax* (Dip.), *Nepa cinerea* and *Pentatoma prasina* (Hem.), etc.—Mr. R. T. Bowman read a report of the Field Meeting at Chingford on May 25th.—Mr. E. Step communicated reports of the visit to the John Innes Horticultural Institution, and of the Fungus Foray on Wimbledon Common.—*Hy. J. TURNER, Hon. Editor of Proceedings.*

OBITUARY.

FREDERICK DU CANE GODMAN, D.C.L., F.R.S., F.L.S., F.Z.S., etc.
1834-1919.

By the death of Frederick Du Cane Godman, on February 19th, the ranks of surviving naturalists who had already made name and fame for themselves in the mid-Victorian epoch have suffered a notable loss. As a boy Dr. Godman appears to have been delicate, and, in fact, was removed from Eton at an early age for this reason. Yet he lived to complete his eighty-fifth year, and, until well on in life, enjoyed a good constitution, which served him well in the numerous expeditions undertaken by him to collect material for the magnificent collections which formed the Godman-Salvin Museum, all of which I

believe have been placed in the Natural History Museum, South Kensington, though the library remains at the house in Pont Street where he died. Dr. Godman had visited the Black Sea coasts before the Crimean War, and before he went to Trinity College, Cambridge. In 1861 he joined his University and life-long friend Osbert Salvin for the first time in the long-continued exploration of Central America, the results of which are embodied in their joint monumental work, the sixty-three volumes of the 'Biologia Centrali-Americana,' begun in 1879, finished in 1915, and containing over nineteen thousand descriptions of new species of many Orders. All branches of natural history appealed to him. To him, and to Osbert Salvin, the Ornithological Union and the 'Ibis' magazine owe their inception. In his garden were gathered together alpine plants and flowering trees from the Old World and the New. He was an enthusiastic entomologist of the school which laid the firm foundations for modern scientific research. But his writings outside the 'Biologia' are devoted chiefly to birds, either in the pages of the 'Ibis' or in the "Natural History of the Azores," or his monograph on the Petrel group. He was elected a Fellow of the Royal Society in 1882, and later was appointed a trustee of the British Museum. With one exception his election to the Entomological Society of London pre-dates the whole present list of Fellows, though there are one or two other names, I think, included in the same year—1865. He was President in 1891–2, and Vice-President during six years, his last term of service on the Council being served in 1900, and, until a few years since, he frequently attended the meetings, especially when the exhibits included collections made by travellers beyond the nearer European limits. On the completion of the 'Biologia' he was awarded the Gold Medal of the Linnean Society. Meanwhile he had joined the Entomological Society of France in 1880, and M. Charles Oberthür has included his portrait in the gallery of contemporary entomologists published in his 'Lépidoptérologie Comparée.' Nor were his activities confined to natural history and sport alone. As editor-in-chief of his *magnum opus* he acquired a first-rate technical knowledge of printing and plate-making; he also was an expert on Oriental pottery and English china. Personally he will be remembered by all who came in contact with him as among the kindest and courtliest of men, encouraging, sympathetic, and generous. Dr. Godman's first wife was a sister of Mr. H. J. Elwes, of Colesborne, with whom he had so many tastes in common, alike in the fields of science and of sport. His second wife, Dame Alice Godman, and two daughters survive him. He lies in the churchyard of Cowfold, close to his Sussex home.

H. R.-B.

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TWO NEW STEPHANIDÆ.

By E. A. ELLIOTT, F.Z.S., F.E.S.

Fenatopus punctatus, sp. n.

♀. Frons arcuate rugose, vertex and occiput finely transrugose, temples smooth and shining, posterior margin of head bordered; three carinæ between the posterior ocelli. Scape slightly longer than cheeks, second flagellar joint twice as long as first, third as long as first and second together. Pronotum strongly transrugose, with broad, smooth posterior margin; mesonotum transrugose; central lobe of scutellum smooth with a few large punctures, the lateral lobes closely punctate; propleuræ smooth, mesopleuræ alutaceous, metapleuræ and median segment cibrate punctate. Petiole finely trans-striate, shorter than rest of abdomen, which is smooth and shining. Terebra as long as body, white banded. Hind legs with the coxæ trans-striate, femora finely trans-striate, tridentate, tibiae compressed to middle. Wings hyaline, nervures rufescent.

Rufescent; a broad white band under eyes to base of mandibles.

Length $13\frac{1}{2}$ to $16\frac{1}{2}$ mm., abdomen $8\frac{1}{2}$ to 11 mm., petiole 4 to 5 mm., terebra $13\frac{1}{2}$ to $16\frac{1}{2}$ mm.

Burma. Type and cotype in British Museum.

The smaller specimen bears a label, "Birmah, F. Smith coll.", the other merely "Birmah."

The close puncturation of the lateral lobes of scutellum is very characteristic.

Diastephanus chinensis, sp. n.

♀. Frons very finely striate, transversely below, becoming longitudinal above round the anterior tubercle and in the ocellar space; vertex and occiput finely longitudinally striate, temples smooth and shining, posterior margin of head bordered. Scape as long as cheeks, second flagellar joint twice as long as first, third as long as first and second together. Pronotum trans-striate, the semiannular part more coarsely, especially laterally. Mesonotum coarsely punctate, central lobe of scutellum smooth with diffuse large punctures, the lateral lobes with the exterior half longitudinally striate. Propleuræ longitudinally striate above, smooth beneath, mesopleuræ alutaceous, metapleuræ coarsely punctate above, trans-striate beneath, separated

by a carina from the cibrate punctate median segment. Petiole finely trans-striate with extreme apex smooth, as long as rest of abdomen, which is smooth and shining. Terebra slightly longer than body, black with white subapical band, the spicula rufescent. Hind coxae trans-striate, their femora finely alutaceous and shining, bidentate, tibiae compressed to beyond middle, alutaceous, the explanate part less coarsely sculptured. Wings hyaline, nervures brown.

Black; head except vertex, two basal antennal joints and the anterior legs rufescant.

Length 12 mm., abdomen 8 mm., petiole 4 mm., terebra 13 mm.

China: Haut Mékong, Tong King; R. V. de Salvaza, April 13th, 1918. Type in British Museum.

Distinguished by the sculpture of the frons and vertex, and especially by the striation on outer lobes of scutellum.

16, Belsize Grove, N.W. 3.

NOTES ON STEPHANIDÆ.

By E. A. ELLIOTT, F.Z.S., F.E.S.

In the 'Bulletin of the Museum of Comparative Zoology' at Harvard College, U.S.A., Mr. C. T. Brues describes *Parastephanius orbitalis*, a new species from Solomon Islands, and gives a key, founded mainly on colour, for the species known to him, seven in number, all of which occur in the Indo-Malayan region. Thirteen are known to me, this new species being the fourteenth. Three have been found in Australia only, and one both in New Guinea and in continental Australia. The new species is a male, and has tridentate hind femora—a peculiarity shared only by *P. martini*, Stadelm., ♂, from Sumatra, and thus easily distinguished from the others. They may be distinguished thus:

Head red; mesopleurae shining, apically punctate; median segment coarsely cibrate punctate, 15 mm.—*P. martini*, Stadelm.

Head black, pale yellowish to just above antennæ, orbits pale; mesopleura pubescent in front, smooth and shining behind; median segment with a few large, irregular punctures; 7-8 mm.—*P. orbitalis*, Brues.

Diastephanius salomonis, Westw.

The type specimen is labelled "Solomon's Island (New Hebrides)"; the other specimen in the British Museum was taken by Woodford in the Solomon Islands, and Mr. Brues describes a third specimen from the same locality, or rather one which he considers to be this species. It differs in having the anterior legs black instead of bright ferruginous; the pecu-

iliar structure of the prothorax is not mentioned, and the sculpture of the neck of the prothorax and mesonotum differ slightly. Yet I think it may be considered a colour variety—at least until further investigation. *Stephanus Foggattii*, Cameron, appears to be one of the commonest species of this family in the Solomon Islands. There are seven females and four males in the British Museum, and Mr. Brues records four females and two males taken by Dr. Mann. The large proportion of males is unusual. We are still without any details as to the history or habits of this widely dispersed family.

ON THE PROBABLE HOST OF NOMADA FLAVOPICTA, K.

By R. C. L. PERKINS, M.A., D.Sc., F.E.S., ETC.

In the 'Journal of the Torquay Natural History Society' for 1918 I published a list of the British species of *Nomada* and the hosts to which they are attached, and remarked that there was only one species to which one or more definite hosts could not now be assigned with certainty. This species of dubious habits is *N. flavopicta*, K.—for many years erroneously considered to be Panzer's *jacobaeæ*.

So far as I know only once has a definite host been ascribed to this species, F. Smith having reported it as being a parasite on *Andrena flavipes (fulricrus)*. The locality where this observation was made, according to E. Saunders, was Littlehampton, though Smith, in the second edition of his book, says—no doubt in error—Sidmouth. Smith published a detailed list of his Sidmouth captures and *N. jacobaeæ* is not mentioned therein, and further he expressly states that no parasites were observed at the large colonies of *A. fulricrus* which he found there. It is remarkable that so distinct a *Nomada*, widely distributed as it is in the south of England, and occasionally common, should not be better known as to its habits. In the latest work I have seen by J. D. Alfken, no definite host is given, but it is mentioned that the males have been taken about colonies of *A. argentata*, which is certainly not its host in England. In Suffolk I have found it in some numbers on the flowers of *Knautia*, in company with *A. marginata (cetii)* and *nigriceps*. *A. flavipes* did not occur in the locality, and, though Kirby described his *fulricrus* (= *flavipes*) from specimens taken at Barham, it can hardly be common in the county, since Morley's list adds to this record only a single stylopized male, and that also from the Ipswich district. Tuck, who collected no less than 122 species of bees in the Bury St. Edmunds district, captured *N. flavopicta* there, but no

A. flaripes, though *A. denticulata* and *nigriceps* were found (according to the above-mentioned list), and *tridentata* also occurs. In his Norfolk list Bridgman states that the *Nomada* is generally rare in the Norwich district, but was common one season. *A. nigriceps* he found commonly, and *tridentata* rarely on flowers of *Succowia*, which on the whole appears to be the favourite plant of the parasite. *Andrena flaripes* he records on a single specimen given to him by a friend! Hallett, who has collected assiduously and widely in Glamorgan, informs me that he has not yet obtained *A. flaripes* in the county, but has found the *Nomada* on *Kuuntia* in company with *A. marginata*, *A. denticulata* occurring in the same locality at the same time. F. Smith himself records *N. flaropicta* in numbers near Deal, and *A. nigriceps* and *simillima* from the same locality at the same time, but he makes no mention of *A. flaripes*. Again, in the 'Entomologist's Annual' for 1870 and 1871, he gives the results of about two months' collecting in the neighbourhood of Ilfracombe, N. Devon, and lists the species observed by him. *N. flaropicta* was taken and also *A. denticulata* and *nigriceps*, the former being common on the ragwort. *N. flaripes* was not found at all. The *Nomada* was also taken on Lundy Island, and he suggests that it was parasitic on *Halictus rubicundus*! The only species of *Andrena* found was *pubescens (fuscipes)*—wrongly listed by him under *Halictus*—but either *denticulata* or *nigriceps* may easily have been overlooked on his two brief excursions to the island. As *flaripes* usually forms very strong colonies where it occurs on the Devonshire coasts, its absence from the above lists is very significant. As *A. fuscipes* also belongs to the group of *nigriceps*, it is not impossible that *N. flaropicta* sometimes attacks it, especially in view of the fact that I have positive proof that *N. rufipes (solidaginis)*, its common parasite, also infests *A. denticulata*.

The evidence is strongly in favour of *A. denticulata* as the host of *N. flaropicta*, but that other members of the group of *nigriceps* are also attacked seems fairly certain.

Paignton March 1st, 1919.

NOTE ON SOME GENERA OF NYSSONIDÆ.

By R. C. L. PERKINS, M.A., D.Sc., F.E.S., ETC.

In his synopsis of "British Heterogyna and Fossiliferous Hymenoptera" ('Tr. Ent. Soc.', 1880, p. 265, etc.), E. Saunders kept the three genera *Gorytes*, Latr., *Hoplisus*, Lep., and *Arpactus*, Jur., distinct, considering the differences in neurulation a sufficient reason. In his 'Hymenoptera Aculeata of the British Islands' he follows Handlirsch in uniting all under one

genus, *Gorytes*, Latr., remarking that thus merged together they are easily distinguished from other Sphegidæ by certain characters, which he gives. But this union of the genera at once leads him to give some characters to his genus *Gorytes* which do not apply to it as a whole. Leaving out the question of the differences of neuration which Saunders once considered sufficient for the definition of the three genera, I believe that these are perfectly good and valid on other characters, some of which may be briefly tabulated as follows :

- 1 (2). Mesopleural portion of the thorax not separated from the mesopectus by a distinct groove or ridge; front tarsi of ♀ without a pecten *Gorytes*.
- 2 (1). Mesopleura and mesosternum distinctly separated; ♀ with a pecten on the front tarsi.
- 3 (4). Posterior ocelli distant from the margin of the eyes by a space at least hardly less than that between themselves *Hoplisus*.
- 4 (3). Posterior ocelli much nearer the eye margins than to one another..... *Arpactus*.

I believe all the species of these genera, so far as the habits are known, prey on Homoptera, *Gorytes* and *Harpactus* on cuckoo-spit insects. The genus *Nysson*, as I have elsewhere recorded, seems certainly to be parasitic on members of these three genera. *N. spinosus* appears to be attached to *Gorytes mystaceus*, *N. trimaculatus* to *Hoplisus quadrifasciatus*, and *N. dimidiatus* to *Arpactus tumidus*. Of *Alyson* (*Didineis*) I have not been able to observe living specimens.

Paignton ;
March 1st, 1919.

HESPERIIDS AND THECLIDS.

By J. J. LISTER, F.R.S., F.E.S.

My friend Capt. R. N. S. Tebb and I made a short excursion last May to beat for the larvæ of Hairstreaks and to see the chequered Skipper (*Carterocephalus palemon*) in its native haunts. Some account of our doings may, I hope, be of interest to our fellow-entomologists.

We started from Cambridge on the afternoon of Friday, May 24th, and bicycling from Huntingdon, reached the "Wheat-sheaf" on Alconbury Hill about six. We were able to put in an hour in Monk's Wood beating the sloe-bushes before dinner, and I had the satisfaction of bringing back seven nearly full-grown larvæ of *Thecla pruni* and three small larvæ of *Zephyrus betulae*. For the three following days we had much cloud, a north-east wind and a little sunshine; but when beating for larvæ one is,

happily, much less dependent for success on the weather than when after the perfect insect, and we did very well. The oak branches supplied a good haul of the larvae of *Z. quercus* to the beating-tray. Many of the oaks at Monk's Wood were infested with an astonishing number of the greenish-grey larvae of *Tortrix viridana*. They had cleared off the young leaves and were hanging by silken threads, which, becoming entangled, formed thick ropes, up and down which the larvae moved. As one walked or bicycled under the trees one's head and shoulders were immediately festooned, and the sound of their "frass" falling on the dead leaves was like that of a shower of fine rain.

Besides these three species of Theclid larvae we saw or took, on the wing, the two Skippers *H. malvae* and *N. tages* (very plentiful when the sun was out), *C. argiolus* and *P. icarus*, *Pieris rapae*, *napi* and *brassicae* (the two latter species very common), several *E. cardamines*, and a few *G. rhamni*. Of hybernated Vanessids we saw *V. io*, *A. urticae*, and *P. cardui*. The males of *R. euphydryas* were out and common in the sheltered and low-lying north-east corner of the wood when the sun shone, but the females very scarce. *P. megaura* and *C. pamphilus* were fairly abundant—fifteen species of perfect insects and three of Theclid larvae.

On Monday morning (May 27th) we took the 7.15 train to Peterborough and bicycled up the Nene valley to Wansford (seven miles), where the Great North Road, which we had left at Aleonbury Hill, crosses the river into Northamptonshire. There is a fine old stone bridge with angular recesses above the piers, allowing foot passengers to take shelter from the coaches, which must have gone by at a sharp pace as they came down through the village, southward bound. The stream below was a sheet of white from the beds of water ranunculus.

The town was full owing to the camps of the Air Service in the neighbourhood, but we found good accommodation at the "Paper Mill" Inn on the south side. We started off about 9.30 for a wood some three miles away to the north-west. It is a north-eastern outlier of the tracts of woodland, marked in the map as Rockingham Forest, scattered over the higher ground (230-400 ft.) between the Nene and the Welland. The crumbly oolitic soil into which we had passed on the way from Peterborough is a pleasant contrast to the stiff clay of Monk's Wood. Many limes are here mingled with oaks and birches, and I did not notice any privet. The oaks were, moreover, free of the depredations of *T. viridana*.

The sun began to come out, at intervals, about eleven, and we were soon catching *C. polyommatus*, the Chequered Skipper—the first time that I had met with it in England. There were very few females, but the males were the commonest butterfly in the wood, frequenting the open glades where there is high grass and

bracken and sunny spots in the rides and paths, where they are attracted by the purple spikes of the bugle (*Ajuga reptans*). One of my specimens presents the variation of having the line of orange spots near the border of the hind wing (upper side) absent. *N. tages* was abundant again, but *H. malæ* not nearly so common as at Monk's Wood.

I took two specimens of *Callophrys rubi* on the wing—the first time I have even met with this exquisite species in good order.

In a cloudy interval I turned my attention to a big wych elm tree whose branches swept down to the ground, and noticed a brownish onisciform larva different from any we had seen at Monk's Wood feeding on the leaves—the larva of *Thecla w-album*, the White-letter Hairstreak. Further search revealing several more, I called to my companion to come and share the fun. Not expecting to do any beating here we had left our trays at the inn, but by beating over our coats and by direct collecting we succeeded in obtaining some ninety larvæ of this species from the branches of this one tree which came within our reach, and they were probably equally abundant all over it. Though we searched the wood with some care we failed to find any other elm in it. We had thus in our four to five days' expedition obtained examples, either larval or adult, of all the British Theclidæ, and I may here add that our larvæ emerged well and gave us beautiful series, though with very little range of variation.

Capt. Tebb secured a single male example of *N. lucina* in good order, but we met with no others.

B. euphrosyne was fairly abundant here again, as were the females of *P. egeria* var. *egerides*—members, I suppose, of the first brood, delayed in their emergence by the cold spring.

The lily-of-the-valley (*Convallaria majalis*) is common under the oaks in parts of this pleasant wood, though there was very little sign of flower. The columbine (*Aquilegia vulgaris*), which one does not very often come across in England, was also there, and the white-flowering *Allium* was abundant.

We returned to Cambridge on the afternoon of May 28th, well content with our takings.

Merton House,
Grantchester,
Cambridge.

LEPIDOPTERA FROM SOUTH NORWAY.

By J. C. HAWKSHAW.

(Concluded from p. 68.)

HETEROCERA—(concluded).

TORTRICIDÆ: *Acalla variegana*, August, 1909, July, 1910; *A. schalleriana*, September, 1906, 1907, July, 1908, 1910, bred July (*V. vitis idæa*); *A. ferrugana*, September 20th, 1906, dark variety; *A. holmiana*,

bred mountain ash, July, 1908; *Caucacia podana*, Brevik Station, July 28th, 1907, not seen at Vigeland; *C. xylosteana*, July 24th, 1908, one only; *C. sorbiana*, July 16th, 1912, one only; *C. muscularia*, June 19th, 1907, one only, worn; *C. lecheana*, 5 specimens in 1906, not seen other years; *Pandemis corylana*, July, 1910-12; *P. ribeana*, June 23rd and 27th, 1906, August, 1907, and at Voksenkollen, June, 1906; *Eulia ministrana*, July 4th, 1907, one only; *Tortrix forskalearia*, July 23rd, 1905, one only; *T. bergmanniana*, bred larva on rose, July, 1907; *T. conwayana*, July 9th, 1912, abundant about some young larch I had planted; *T. lofstringiana*, August 4th, 1909, and bred mountain ash, September, 1908, and July, 1910; *T. viridana*, July 5th, 1908, only one seen; *T. rusticana*, June, 1904, May 25th, 27th and 29th, 1905; *Cneophasia osseana*, July 5th and 10th, 1900; *C. wahlbomiana* var. *virgaureana*, June, July and August; *Erapate congregatella*, November 4th, 1909, abundant in forest; *Anisotania hybrida*, May 23rd, 1905, one specimen; *Conchylis ambiguella*, July 2nd, 1906, one specimen; *C. hartmanniana* var. *subhaumaniana*, June 1st, 1905, June 21st, 1906, June 20th, 1907, May 17th, 1910; *C. badiana*, June 26th and 27th, 1908, two specimens; *C. ciliella*, June 1st, 1905, two specimens, June 27th, 1908; *Euxanthis angustana*, July 1900-05, '06-'07, July 1st, 1906, June and July, 1908, August 15th, 1909; *Evetria pinivorana*, June 28th, 1907; *E. turiorana*, June 5th, 1904, June 1st, 1905, June 6th and 25th, 1907; *Olethreutes schreberiana*, June 10th, 1907, one specimen; *O. corticana*, August 4th, 1909, one specimen; *O. betuloctana*, August 4th, 1905; *O. variegana*, July 18th, 1907, July 4th, 1908, Brevik Station; *O. dimidiata*, June 29th, 1907, one specimen; *O. striana*, August 27th, 1904, July and August, abundant; *O. branderiana*, June 29th, 1906; *O. metallicana*, 1906, June 27th, 1907; *O. schulziana*, very abundant June, 1907, throughout bogs in forest; only one other specimen seen in eleven years in same localities; *O. urticana*, July, 1906, '07, '08, '12; *O. lacunana*, June, July and August, common; *O. luctuosa*, July 8th, 1907, July 9th, 1908, Voksenkollen, July 19th, 1907; *O. cespitana*, June, 1900, July 14th, 1900, and July 8th, 1907; *Steganopticha ramella*, July and August, 1905; *S. oppressana*, August 1st, 1905, August 10th, 1909; *S. corticana*, August, 1905, June, 1906; *S. ratzeburgiana*, August 10th, 15th and 18th, 1909, three specimens; *S. fractifasciana*, May, 1910; *S. quadrana*, May, 1905; *S. trimaculana*, July and August, 1908, '09, '10; *Gypsonoma incarnaana*, July 21st, 1900; *Bactra lanceolana*, July, 1906, '07, '08, August, 1909; *Semiasia hypericana*, June, July and August, abundant among hypericum and bred; *Notocelia roborana*, bred rose, July; *Epiblema scopolana*, June 29th, 1906; *E. coccimacula*, July 15th, 1900; *E. tedella*, June and July, common; *E. couleriana*, June and July, 1905, '07, abundant; *E. subocellana*, June 8th, 1904, June 30th, 1906, and July 12th, at Voksenkollen; *E. nisella*, July, 1908; *E. penkleriana*, July and August, common; *E. ophthalmicana*, October, 1906, common; *E. solandriana*, August and September, abundant, and bred birch; *E. hilunana*, one worn specimen, July 29th, 1905; *E. luctuosana*, bred sallow, August, 1907 and 1908; *Grapholitha strobellla*, July 14th and 15th, 1907, bred spruce; *G. internana*, May, 1904, '05, '07 and '10, abundant; *G. inquinata*,

June, July and August, 1905, '07, and '08; *G. dorsana*, May and June, 1905 and 1910, abundant; *Anycis lundana*, June, 1906 and 1912; *A. myrtillana*, June, 1907, July, 1912; *A. siculana*, July, 1900 and 1901, June, 1904 and 1906, May, 1905; *A. unguicella*, June 1906, '07, and '08, May, 1905 and 1910; *A. uncana*, May 27th, 1904, May 29th, 1905, May 17th, 1910; *A. mitterbacheriana*, August 4th, 1909, May 17th, 1910; *Rhopobota nærvana*, July 30th, 1905, June 29th, 1906, July 15th, 1907, August 3rd, 1909; *Lopoptyna saturnana*, June 26th, 1906, July 7th, 1906, June and July, 1907.

GLYPHIPTERYGIDÆ: *Simaethis pariana*, July 4th, 1907, August 10th, 1909, beat Scotch fir; *Glyphipteryx thrasonella*, July, 1908, July, 1912.

YPONOMEUTIDÆ: *Scythropia cratægella*, July, 1900 and 1910; *Yponomeuta cognatellus*, bred colonies on apple, August, 1907; *Y. padellus*, July 15th, 1900; *Y. evonymellus*, July and August, 1907, 1909 and 1910; *Swammerdamia cœsiella*, July 2nd, 1906, one specimen; *Prays curtisellus*, June 31st, 1905, July 21st, 1912, two specimens; *Argyresthia conjugella*, August 19th, 1905, at Voksenkollen; *A. spinella*, August, 1905, 1909 and 1910, and at Bykle, August, 1910; *A. ephippella*, abundant, August, 1905, on cherry-tree, and July, 1906 at Voksenkollen, July 20th, 1906; *A. nitidella*, August 18th, 1909; *A. aurulentella*, July and August, 1905, and July, 1907; *A. retinella*, abundant June, July, and August, and at Bykle, Sætersdal; *A. cornella*, July 7th, 1907, on cherry-tree, and July, 1908, on apple; *A. sorbiella*, abundant July, 1905, bred mountain ash, 1910, and at Voksenkollen, July, 1906; *A. pygmæella*, July 23rd, 1905, and bred swallow, Voksenkollen, 1906; *A. gædartella*, abundant July and August, and at Valle, Sætersdal; *A. brockeella*, July 2nd and 29th, 1906; *A. præcocella*, abundant, beat juniper, and at Voksenkollen, July, 1907; *A. illuminatella*, June, 1906, July 15th and 19th, 1907, beat spruce; *Cedestis gysselinella*, bred from pupa in web on fork of twig, July 30th, 1905, and beat many from Scotch fir, August, 1909; *C. farinatella*, July 27th, 1905, August 1st, 1910, and August 5th; *Oenerostoma piniariella*, August 30th, 1904, May 17th, 1910, beat Scotch fir, and Voksenkollen, July 19th, 1907, beat spruce.

PLUTELLIDÆ: *Plutella maculipennis*, May and July; *Cerostoma sequella*, June 29th, 1905, one specimen; *C. radiatella*, beat one August, 1905, and five July and August, 1909 and 1910; *C. parenthesella*, July 27th, 1905, one specimen; *C. lucella*, July 27th, 1910, beat one specimen; *C. scabrella*, July 26th, 1908, beat one specimen.

GELECHIIDÆ: *Bryotropha terrella*, June, July and August, and July, 1909, Sætersdal; *Gelechia sororeculella*, bred swallow, November 22nd, 1912; *G. peliella*, July 7th, 1906, July 24th, 1907, August 3rd, 1909, one among moss on rock; *G. ericotella*, May, June and July, common among heather; *G. infernalis*, May and June, common among heather; *G. virgella*, May 21st, 1911, in bog; *G. diffinis*, August 27th, 1904, one specimen; *G. murinella*, September 12th, 1906, one worn; *G. alburnella*, August 18th, 1909; *G. proximella*, July 20th, 1900, one specimen; *G. dodecella*, July 2nd, 1906, one specimen; *Acompsia cinerella*, July 29th, 1910, one specimen at Valle, Sætersdal; *Tachyptilia populella*, several at rest on willow, September 12th, 1906, and bred from rolled leaves on aspen and

sallow: *Xystophora tenebrella*, abundant on grass slopes June and July; *Anacampsis vorticella*, by sweeping, July, 1906 and 1907; *Sophronia semicostella*, July 11th and 15th, 1900, three specimens; *Endrosis lacteella*, June 28th, 1901, one specimen; *Pleurota bicostella*, June, July, common, and at Voksenkollen: *Chimabache fagella*, May 19th, 1911, rest tree, one specimen; *Semioscopis avellanella*, July 29th, 1910, Valle, Sætersdal; *Depressaria pimpinellæ*, bred July and August, 1912, from larva, very abundant on *Pimpinella saxifraga*; *D. nervosa*, July 4th, 1901; *Harpella forficella*, July 5th, 1908, one specimen, beat: *Borkhausenia unitella*, June 27th, 1908, one specimen; *B. flavifrontella*, July 13th, 1900, one specimen; *B. pseudopretella*, July and August.

ELACHISTIDÆ: *Coleophora ruminatella* (?), May 28th, 1905; *C. fuscoviridella*, July 14th, 1907, and beat birch, May 19th, 1907, at Voksenkollen; *C. troglodytella* (?), June 17th, 1906, one specimen; *C. manipennella*, abundant among grass, May, 1910; *C. virgaureæ*, June 7th, 1904, one specimen; *C. laripennella*, abundant among *Ciacanepodium*, August, 1904; *Elachista gleichenella*, beat juniper, July, 1907; *E. albifrontella*, July, 1907 and 1912; *E. triatomea*, July 3rd, 1908; *E. argentella*, June 26th, 1908, one specimen.

GRACILARIIDÆ: *Gracilaria alchimiella*, June 13th, 1900, July 20th, 1900, July 15th, 1910; *G. syringella*, July 4th and 5th, 1908, August 5th, 1909; *G. auroguttella*, May 22nd, 1907; *Ornix urolanella*, July 4th, 1908, beat hazel; *Lithocletis cramerella*, June 5th, 1904; June 1st, 1905; *L. ulmijoliella*, July 23rd, 1905; *L. junoniella*, July 8th, 1912; *Tischeria marginata*, June 27th, 1906, June 29th, 1907.

LAONETIDÆ: *Lyonetia clerkella*, July 15th, 1900, on wing about *P. padus*, cocoons very abundant on cherry-tree in 1912; *Bucculatrix frangulella*, July 12th, 1900, July 30th, 1905; *B. artemisiæ*, var. *ratisbonensis*, July 14th, 1912, beat.

TALAROIDIDÆ: *Tidaporia tubulosa*, June 29th, 1901, July 7th, 1907.

TINEIDÆ: *Aerolepta arnicella*, July 1st, 1906; *Monopis rusticella*, August 19th, 1909; *Trichophaga tapetzella*; *Tinea parasitella*, July 14th, 1912; *T. albipunctella*, June 11th, 1900; *T. pellionella*, July and August; *Incurvaria morosa*, July 1st, 1907, May 17th, 1910; *I. lucella*, June 22nd, 1906, July 2nd, 1906, July 10th, 1907; *Nemophora swammerdamella*, May 17th, 1910; *N. pilella*, June 4th, 1904, May 25th, 1905, May 28th, June 27th, July 13th, 1908.

ERIOCRASTIDÆ: *Eriocrania subpurpurella*, May 16th and 17th, 1910.

MICROPTERYGIDÆ: *Micropteryx aureatella*, July 12th, 1907, one specimen, worn.

Holycombe,
Lap hook.
Hant

ON SOME NORTH-COUNTRY SPECIES AND FORMS OF
LEPIDOPTERA.

By J. J. LISTER, F.R.S., F.E.S.

Arra, beata Petanus urva!

ON June 24th last year my friend Dr. J. N. Keynes and I set out with the hope of seeing in their native haunts the two North-country Satyrids—*Cenonympha tiphon* and *Erebia epiphron*—in their English and Scottish forms, the northern forms of *Aricia medon* (*salmacis* and *artaxerxes*), and the interesting variety of *Plebeius aegon*, named by Tutt *masseyi*. It seemed possible that a favourable season might bring out some early specimens of *Erebia cethiops* before we came south again.

Our first point was the "Derby Arms," Witherslack, from which our landlord, Mr. Jackson (a champion north-country wrestler), drove over to meet us at Grange-over-Sands on the Barrow and Furness line. Witherslack lies on the inner edge of the great girdle of carboniferous limestone which encircles the Lake Country, at its junction with the underlying Silurian strata, whose volcanic members, the Borrowdale series, rise up in the great dome-shaped mass of which the Lake Mountains are the remains. Just to the south of the inn there is a small, half overgrown quarry by the roadside, worked for road metal, from which one heap of pale grey limestone and one of dark slaty Silurian had been taken, and hummocks of the latter rock, worn smooth by ice, crop up in the field at the back of the inn. To the south and east of Witherslack is a broad stretch of low ground bordering the estuary of the River Kent, as it widens in great serpentine curves to open out to Morecambe Bay. To the east, beyond the Kent, the view is bounded by the big Yorkshire hills. To the north the limestone hill, Whitbarrow (706 ft.), with its abrupt, cliff-like sides and bare, white scalp is a prominent feature, and to the right of it one sees along a tributary of the Kent (the Gilpin), far up among the great hills, Long Sleddale and the ridge of Lord's Seat and Grey Crag over towards Hawes Water. To the west of Witherslack the River Winster flows south from the neighbourhood of Bowness to the mouth of the Kent estuary, and here divides Westmorland from the western outlier of Lancashire. The view in this direction is limited by low, wooded hills of carboniferous limestone.

Alongside the courses of the Winster, the Kent and its tributary, the Gilpin, there are extensive stretches of peat formation known as mosses. Witherslack Moss lies between the Winster and the road to Grange, Meathop Moss to the east of that road; between it and the Kent, and other scattered mosses stretch away

northward along the course of the Gilpin to the north of Whitbarrow; Holker Moss is an outlier to the south-west of Grange, and many others are found to the southward along the low-lying Laneashire coast-line.

These mosses are, in the neighbourhood of Witherslack, the haunt of *Cornonymphia tiphon*, the Large Heath. Meathop Moss, which is the most accessible from the "Derby Arms," forms a long strip, elevated several feet above the general low level of the surrounding country. It is dug for peat at the north end, where a vertical face some 6 ft. high is exposed, and this is not nearly at the highest part. The vegetation is mainly heather (*C. vulgaris*), *Erica tetralix* and *Scirpus (Eleocharis) cespitosus*, the "Deer's Hair," which grows in fine hemispherical tussocks composed of the stiff, setaceous flowering stems and young leaves springing from dense upstanding bases. There are also patches of cotton grass and reindeer moss. *Andromeda* grows abundantly, and the bog asphodel (*N. ossifragum*). *Sphagnum* is found in holes and ditches, but there are no extensive tracts of this moss. A straggling wood of small Scotch firs and birches runs along the ridge for some distance. A buzzard had her nest, with half-grown nestling birds, in a fir at one end of it. Herring and lesser black-backed gulls nest on the moss and stand up on the tussocks in indignant exostination at intruders. Their eggs had been very freely taken for food earlier in the year, and there were still some nests with eggs. Their varied cries—laughing, talking, querulous—mixed with the long, rippling breeding note of the curlews, were constant while anyone was in their neighbourhood.

Whenever the sun came out the Large Heath (*C. tiphon*) appeared flitting over the moss. We really had very little continuous sunshine during the four days of our stay, though there were fairly frequent sunny intervals. Our last morning (Friday) was, however, bright and fine, and then *tiphon* was on the wing in abundance. It is not always easy to catch, as it has a way of flitting on down the wind, now and then settling for a few seconds and then on again, and pursuit over the rough, tussocky surface beset with many bog-holes is not too easy. Sometimes one finds them feeding at the *Erica* flowers and often at rest on the heather or grass. As soon as the sun goes in they cease to fly of their own accord, though they may still be put up and pursued down wind, or taken at rest on the sheltered side of a tussock. Many males were in fine order, and the females, though much fewer, were generally very fresh.

The form inhabiting these mosses is the var. *philoxenus*, Esp., the "British southern form" of Dr. Buckell, who has written an excellent review of the British varieties of *tiphon*.* It extends southward to Delamere Forest in Cheshire, and just over the northern borders of Shropshire and Staffordshire. *Philoxenus*

* F. J. Buckell, 'Ent. Record,' vol. vii, 1895-6, p. 100.

is characterised by the dark filbert-nut brown of the upper side, only slightly paler in the female, and by the full development of the ocellated spots, in which, on the under sides, a silvery-white middle is succeeded by a broad ring of velvety black, and this by pale ochre, giving a very bold and handsome appearance. The spots are also well marked on the upper sides. On the under side of the hind wing there is a spot between each of the nervures, that between the two posterior being usually double—a feature found in some other Satyrids (*e. g.* *Pararge megæra* and *P. achine* and in *M. galatea*) and almost universal in the Lycaenidi. In 14 per cent. of my males, and in 21 per cent. of females, a spot varying in degree of development is present between the first (submedian) nervure and the margin of the wing. My specimens show a good deal of variation in the colour of the under-side of the margin of the hind wing, from ashy gray to tawny brown, and in this respect do not agree with Dr. Buckell's description. I have one well-marked variety, in which a bar of white extends from the middle of the irregular white band which traverses the hind wing (un. s.) to the base of the wing.

We found *tiphon* equally abundant on Witherslack Moss, and it appears to range widely over the other mosses in this neighbourhood.

A. sylvanus was fairly common on Meathop Moss.

In the little half-overgrown quarry near the inn, mentioned above, the rock rose (*Helianthemum*) is common on the limestone, and here we found a colony of *A. medon*. Several, though not nearly all of them, have the discal spot (up. s. f. w.) ringed with a margin of white of varying breadth, and the black middles of the spots on the under side in some cases reduced in size. This variation seems to be better marked in the females than the males. Several of my males have the rusty spots absent from the upper sides of the fore wings. In all four respects they approach the form *Artaxerxes*, which is peculiar to Scotland.

The population of *medon* seems curiously localised in this neighbourhood, considering how widely distributed its food-plant (*Helianthemum*) is. Later I found the species fairly abundant at one point on Arnside Knott, and there the variation seemed to be somewhat better marked. It appears to be the var. *salmacis*, for some time regarded as a distinct species, and known as the Castle Eden Argus. We were interested in finding it on this west side of England; but I have females of *medon* which have just as good a right, as far as I know, to be called *salmacis*, from the Roman Road near Cambridge, Royston and Hitchin, and almost as well marked as any of these Westmorland forms, though of course they are very much scarcer.

In the little quarry we also found a colony of *C. minimus* past their best condition, and the females of *P. icarus* were

represented at Witherslack by some very fine and well-marked varieties.

A. aglia began to appear before we left on June 28th.

We had the pleasure of meeting Col. Clement Browne, R.E., at Witherslack. He had just come from Langdale, where he had obtained a fine series of *Erebia epiphron*. This was very satisfactory news, as I had been in considerable doubt whether I had been well advised in proposing Langdale as our headquarters in our search for this species.

On leaving we drove over to Kendal and went to Windermere, joining Mrs. Keynes *en route*, and from Ambleside drove up to the "Old Dungeon Gill Hotel," at the foot of Langdale Pikes. It was very beautiful going up Langdale in the quiet dusk of the summer evening, the beginning of three days of almost cloudless weather.

It was not till we had climbed up nearly to the 2000-ft. level the following morning that we met with *epiphron* in any numbers, but at this level, over the wide, shallow, grassy basin between the Pikes, which is the collecting ground for Dungeon Gill, we came on them in profusion. They fly like slow, black bees just above the level of the grass, and settle here and there to feed on the wild thyme or *Potentilla tormentilla*. They were about us as we ate our lunch on the highest of the Pikes (Harrison Stickle, 2401 ft.), and continued over the exposed high ground, though in lessened numbers, for 1½ miles to High Raise (2500 ft.) to the north, and from there to Sergeant Man (2414 ft.) to the south-east. They became abundant again on the more sheltered slopes leading down to Stickle Tarn, but ceased long before the level of the tarn (1540 ft.) was reached. Except where the bare rock is exposed, the whole of this plateau has a grassy covering* with a little whortleberry and crowberry here and there.

Flying with *epiphron* in the bright sunlight, and fairly abundant, was the handsome Wood Tiger moth (*Parasemia plantaginis*), the males of which are dimorphic, the majority having the hind wing and sides of the abdomen orange-yellow, and others (var. *hospita*, Schuff.) white. *C. pamphilus* was also fairly abundant at this high level, but I saw no other butterflies.

We spent the best part of two cloudless days in this delightful region.

On another day I took a walk to find, so far as I might, the distribution of *epiphron* to the westward. Going up Mickleden, I climbed the rough track of Rossett Gill, and at the top, at nearly 2000 ft., found it again, and had it with me as I descended to the foot of Angle Tarn and for some distance up the slope to Esk Hause. A raven flew over the tarn as I passed, its hoarse

* Here is a list of the common plants which I gathered on the plateau: *Vaccinium Myrtillus*, *Empetrum nigrum*, *Juncus squarrosus*, *Luzula campestris*, *Scirpus cespitosus*, *Eriophorum vaginatum*, *Carex ampullacea* (or ? *relicaria*), *Anthoxanthum odoratum*, *Nardus stricta*, *Aira flexuosa*, and *Festuca ovina*.

croak resounding finely as it echoed among the crags "in symphony austere."* But *epiphron* ceased long before I got to the top. I saw nothing of it about Sprinkling Tarn, and only one worn specimen rewarded my search round Sty Head Tarn. I was surprised at my failure, so nearly complete, to find it, as it was seen, according to Newman, "in considerable abundance" at both these places a generation or two ago.† Since my return, however, I have learnt that Dr. A. H. Foster has also failed to find it at these old localities in his exploration of the distribution of *epiphron* in the Lake Country.‡ He does not give Angle Tarn as a locality, but finds it along the high ground separating the head of Borrowdale from the Buttermere and Ennerdale valleys as well as on the Langdale plateau, Helvellyn, and the Red Scree. If it has been exterminated about Sty Head and Sprinkling Tarns the need of moderation in collecting would be evident, but we found it so abundantly that I have not hesitated to make public the results of our experience.

The butterfly fauna of Langdale appears very limited. *P. icarus*, one specimen of a "white," *A. urticæ*, *E. epiphron* and *C. pamphilus* made up our list.

Loch Rannoch was the locality which we had selected as our hunting-ground for the Scottish forms, and we have no reason to regret our choice.

We reached Pitlochry on the evening of July 3rd, and about 9.30 next morning set off for the twenty miles' drive to Kinloch Rannoch. Struan, some distance further along the line, gives an easier means of access, but the drive up the Tummel Valley from Pitlochry is through incomparably finer scenery. We found very comfortable quarters with Miss MacIntyre at "River View." Kinloch-Rannoch is not (as the name would imply) at the head, but at the foot, of Loch Rannoch, where the river Tummel, the haunt of oyster-catchers and black-headed gulls, flows out in its easterly course to join the Tay. Loch Rannoch is nearly ten miles long and a mile wide for most of its length and lies in a fine open valley, with big mountains guarding its eastern end—Beinn à Chuallaich (2925 ft.) to the north and

* The whole of this verse so finely draws the environment of *epiphron* in the Lake country that I hope I may be permitted to quote it:

"There sometimes doth a leaping fish
Send through the tarn a lonely cheer;
The crags repeat the raven's croak,
In symphony austere;
Thither the rainbow comes--the cloud--
And mists that spread the flying shroud
And sunbeams; and the sounding blast,
That, if it could, would hurry past;
But that enormous barrier holds it fast."

—“Fidelity,” Wm. Wordsworth, 1805.

† ‘British Butterflies, p. 82.

‡ ‘Entomologist,’ xl, July, 1907, p. 130.

Schiehallion (3547 ft.) to the south. (I follow the spelling of the ordnance map, though not without a suspicion that it is pedantic.) High ground extending up to over 2000 ft. closes in the valley to the south of the loch, but on the north side the level descends considerably to the westward.

The Black Wood of Rannoch forms a fine feature half-way along the southern side, one of the few remaining patches of the "ancient Caledonian Forest, which at one time extended from Glencoe to Braemar."* Near the loch it is almost wholly composed of Scotch fir, but birches are intermingled as one ascends the side of the valley. The trees are beautifully grown, though the trunks rarely exceed 2 to 3 ft. in diameter, and are scattered, fairly widely spaced, in a fine natural disorder (or order!). Near the loch there is very little variety in the undergrowth, heather predominating in some places, whortleberry in others, and it is thrown into hummocks by the high domed nests of the wood-ants. The general effect is large and simple and stately, though, as the wood is said to have been a main source of timber for the neighbourhood, one cannot be sure that its characters are wholly primeval.

Birches and alders grow to a great thickness of trunk and are more or less closely scattered over the lower slopes of the hills, and the bracken reaches up their sides to a height of about 1000 ft., to be succeeded by heather with tracts of dwarf willow, bog myrtle and grass. The whole area is formed of "quartzite and quartzite schists and schistose greywacke," being a member of the great series of metamorphic rocks of the highlands, but bands of a calcareous formation occur here and there, so that even a small scale geological map is useful in searching for *A. medon* var. *artoxeres*, whose food-plant is limited to a calcareous soil.

We had rather strong westerly winds, much cloud and some rain during our stay, which lasted rather more than a week, but there were often spells of sunshine, and we managed to accomplish our purposes to our satisfaction, though we had to work much harder than at Witherslack.

(To be continued.)

* "New Statistical Account of Scotland," No. xix (1838), p. 527.

NOTES AND OBSERVATIONS.

HIBERNATION OF AGLAIS URTICEÆ, ETC.—*À propos* of Mr. H. Rowland-Brown's note regarding the early hibernation of *A. urticae* in 1918 (*antea*, p. 68), I may say my own observations coincide exactly with his. In August the species was plentiful, and in September I only netted one specimen—on the 28th. This was a male of a very nice form, having connected black scales on the costal area and but a slight blackish suffusion on the hind wings. I have bred something approaching this, but it is new to me as a wild form. Whilst cycling to Radlett on October 8th a pair of *A. urticae* were seen apparently searching for winter quarters, and this constituted my last record of the species for the year, although I made a number of excursions until the end of November. *P. atlanta* was frequent in West Herts, particularly in the neighbourhood of Berkhamsted, last April, and numbers of the larval "tents" were seen on various occasions during the summer. Many larvae were badly ichneumoned in early July, and the parasite must have done its deadly work only too well, for I did not come across a single imago later on in the year. Other observers in our district have had a kindred experience. In reference to the vexed question of the hibernation of *P. atlanta* in this country, I see I have a record of the insect on the wing as early as February 17th. This, too, in an inland district. Rather an early immigrant! *P. cardui* was fairly plentiful with us last July, but disappeared at the end of the month. I could not obtain either ova or larvae, although I examined many plants of *Carduus arvensis* and *C. lanceolatus*, and even *C. nutans*, the musk thistle, which sometimes seems to inspire the Painted Lady with affection. I have one or two records of the hibernating freaks of *V. io* which may be of interest. Some years ago I was spending the Easter holiday at an Essex bungalow, and whilst adjusting a ventilator—of the sliding grille type—came across three dead specimens of *io*. They appeared to have been there all the winter, and why they should have chosen such a draughty "dug-out" I cannot say. It would have been an easy matter to have selected a cosy corner in the rafters. On another occasion I found a hibernating cluster of five *V. io* on the rafters of an outhouse, huddled together like so many fowls in severe weather. Taken with Mr. Rowland-Brown's observations on the habits of *A. urticae* it would seem that gregarious hibernation is common to both species. It would be interesting to ascertain definitely to what extent the habit applies to the other allied Vanessids.—ERNEST M. NIMMY; 210, Whippendell Road, Watford, Herts.

HIBERNATION, ETC., OF AGLAIS URTICEÆ.—I was much interested in Mr. Rowland-Brown's letter upon these subjects, for they happen to have come before my notice lately. With regard to the early hibernation of *A. urticae*, a specimen settled down for its winter quarters on August 5th of last year on the cornice of the upstairs landing in my house. The spot is well lit and quite open to observation, but the insect remained there until February 18th this year. A warm day then brought it down from its post, and on examination I

found it to be in almost perfect condition. With regard to the gregarious habits of *A. urticae* in hibernation, and its fondness for forming "roosts," my attention was first drawn to this peculiarity in the middle of February last year. Going into the chapel of one of the Oxford colleges I found the floor covered with semi-torpid specimens of *A. urticae*. I counted between thirty and forty, which had evidently been awakened by the unusual warmth of the day, and become chilled on fluttering down on to the cold marble of the floor. These insects were all in fine condition. After reading Mr. Rowland-Brown's note in the last number of this magazine I searched my own house and found a "roost" of six individuals on a shadowed part of one of the ceilings. The change in the weather has already caused this number to dwindle to two. Two points suggest themselves. The first is, how the insects are attracted to such places in such numbers. The college chapel which I mentioned is not one which is open to the public for a stated number of hours daily: it is kept closed except during the short periods when it is in use each day. The ceiling is plastered; there is no apparent means of access except by one or two small ventilator windows. Yet the insects were there in considerable numbers. If I had had the time to institute a thorough search I could have found more than I did. Again, the room in my house has the usual plastered ceiling and a large window, which does not, however, open; it is used as a linen room. The only means of access would appear to be by the door, which is only opened quite occasionally, yet *A. urticae* decided to form a "roost" there. Secondly, does the female *A. urticae* hibernate immediately upon impregnation, and is the longer part of her active life spent in the ensuing spring, and not in the very few days, or even hours, which may ensue between emergence and impregnation in the summer? The perfect condition in which the hibernated specimens are so often found suggests this possibility to me.—HAROLD D. FORD (Rev.); Thursby Vicarage, Carlisle.

PARARGE MERA IN SURREY.—When collecting near Horsley, in July, 1908, I captured a female example of *P. mera*. It was flying in company with *P. megera*.—W. S. BUCKHURST, Lt. R.G.A.; 9, Souldern Road, London, W. 4.

RETARDED EMERGENCE OF EUSTRÖMA (CIDARIA) SILACEATA.—Under this heading I recorded in the December number of the 'Entomologist' the breeding of a specimen of the above on October 22nd and another on November 3rd last. I have now to record the emergence of a third specimen on February 27th. All these belonged to a brood the greater part of which hatched out in July, 1918. The pupae were kept in my dressing-room.—J. E. TARBAT (Rev.); Fareham, Hants.

ASTHENIA FILIBRIANA IN ESSEX.—I think this Tortrix might be found in any oak wood throughout the London district, but the difficulty is to obtain it in any numbers. I was working for it a very long time before I obtained a series of some seventeen or eighteen specimens. Upon looking over my notes I find that between the

years 1884 and 1913 I captured or bred exactly thirty specimens, often only one or two in a season, and sometimes none at all. My two best years were 1910 and 1912, when I took six and eleven respectively. Of these thirty specimens only eleven were bred at long intervals from innumerable dead oak-apples gathered by the aid of a long fishing rod from the large oaks for the most part growing in and around various parts of Epping Forest, in the winter and very early part of the New Year. The insect may be found rarely at rest on old palings, but the best way to work for it is to choose a bright, sunny morning at the beginning of April, and, selecting the edge of an oak wood, tap all the boughs within reach. They then fly readily and, I may add, quickly, and are soon lost to view. It is of little use beating on a sunless day, as they then drop like a stone, and from their sombre colour are lost in the undergrowth. I have never found the larva but once, feeding in a green gall of *Andricus terminalis*, but failed to rear it. The somewhat similar but smaller *Asthenia argyrrana* I have frequently found. To any reader interested I would recommend a perusal of Dr. Wood's most interesting paper in the 'Ent. Mo. Mag.,' vol. xxv (1899)—an article of great merit. Mr. Whittle does not seem to have been very lucky in rearing Lepidoptera from dead galls. I have done a little better, as related in my note ('Entomologist,' xlvi, p. 38). The following are the places where I have met with *fimbriana*: In Essex, Loughton, Buckhurst Hill, Woodford, Walthamstow, Hainault Forest, Wanstead (one only), Thorndon Park, and the plantation just outside. In Surrey, at Shirley, Addington, and Sanderstead. In Kent, in West Wickham Wood and Plumstead. The best period to work for the moth is from March 25th till April 15th, in normal seasons.—A. THURNALL: Wanstead.

PHALONIA SUBROSEANA AND GRAPHOLITHA ÆMULANA.—I am pleased to read that Mr. Whittle has found these two golden-rod feeders in Essex, the former being an addition to the county list. I hope he will be able to report *P. curvistrigana* in the near future. All three occur on the Kent side of the river. I never bred the two *Eupaciliae*, but had a beautiful bred series of both some years ago from Mr. B. A. Bower; these were bred from larvae taken in "North Kent," but I do not know the exact locality. *G. æmulana* I have bred freely from larvae obtained from Darenth Wood and also more abundantly from Plumstead. From the latter locality I once bred about a dozen *P. implicitana*—rather to my surprise, as I was unaware at the time that the larva ever fed on golden rod. These specimens were a little darker, but differed in no other respect from those I had been accustomed to meet with in this (Wanstead) district amongst *Matricaria inodora* and allied composites. I may add that *G. æmulana* seems to be a very constant species, whereas its near ally, the saltmarsh-loving *tripoliana*, is exceedingly variable!—A. THURNALL: Wanstead.

HAWK MOTH SETTLING ON WATER.—On June 30th last, at about 11 a.m. on a warm, sunny day, I was walking up the bed of a nearly dry nullah about five miles from Quetta, Baluchistan. When passing a small pool of clear water I noticed a Hawk Moth flying

over it. Presently it settled on the water, the wings being held up clear of the surface and rapidly vibrated. On my trying to catch it it rose and circled round, but soon settled again. After a few seconds it let its wings lie flat on the surface, and thinking that it would be now unable to rise I again attempted to catch it, but it rose without difficulty and flew away. The moth was about the size, shape and colour of *Deilephila euphorbiae*, and as I had previously found the larvae of that moth close by I imagine it to have been of that species, but cannot say for certain. Is not this a somewhat unusual habit?—F. B. SCOTT, Major I. A.

CICADAS AT QUETTA, BALUCHISTAN.—At Quetta, from the 15th to the end of June, 1918, there was a regular plague of Cicadas. A certain road, running out of Quetta for about five miles, was lined with small mulberry and a few willow and other trees. The trunks and branches of these trees were so closely studded with the Cicadas that they appeared gnarled and discoloured. When a motor car passed along the road the insects continually rose in a swarm, resembling a swarm of large bees. The ground on either side of the road was pitted with the holes of the pupa, and the empty pupal cases clung in dozens to every plant and shrub. In the evening the noise near the trees was deafening. The imagines were about two inches long, coloured yellow with red markings, but unfortunately I was unable to identify the species. On being disturbed they squirted a clear white fluid from the abdomen. If a drop of this entered the eye it caused smarting and irritation. In spite of this, dogs, cats and chickens all eat them with relish. At about the end of June they began to die off, and the ground under the trees was littered with their bodies. Some of the smaller trees were so damaged by their attacks that they lost their leaves.—F. B. SCOTT, Major I. A.

THE LATE C. A. BRIGGS'S NEUROPTERA: AN EXPLANATION.—The executors, who have just sold this collection *en bloc*, call my attention to the statement in the current number of the 'Entomologist' that some Neuroptera were recently presented by me to the South London Natural History Society. My note, handed in at the time, stated that they had been received from the "late C. A. Briggs." Unfortunately an editorial emendation has made this "from the late C. A. Briggs's collection," which conveys quite a different meaning. When Mr. Briggs was living in this village many Neuroptera, etc., were given him by me, but nothing received in exchange, except much kind assistance in identifying things. He was then aware that mine was entirely a "one man" collection, but after removing to Devon appears to have forgotten this. A letter from him is before me, dated July 26th, 1897, acknowledging some *Gomphus*, and stating he was working hard at the Perlidae and would return the box later. So far as my recollection goes, it was some little time afterwards when he returned the box with the Perlidae, etc., and a note stating that he objected to sending an empty box. This would make the date more than twenty years ago. In the interval grease has destroyed some specimens, and the remainder have found a resting-place in one of the South London Society's cabinets. After his return from a Rannoch

expedition he sent me a few northern Odonata, and these went some years ago to enrich the same cabinet.—W. J. ASHDOWN; Leatherhead, March 8th, 1919.

LEPIDOPTERA OF THE HIGHLANDS OF SCOTLAND.—With reference to this subject (*antea*, p. 43), may I point out that a larva of *Hemaris fuciformis* and a specimen of *Drymonia chaonia* were recorded from Argyllshire by Mr. W. M. Christy ('Entomologist,' vol. xxix, p. 262).—A. STEVEN CORBET; 32, Hamilton Road, Reading.

IS ARCTIA CAIA HABITUALLY A DAY-FLIER?—I ask because I have been told that it is, and never having met with it or seen it recorded so flying to the best of my recollection, I shall be glad of definite information on the subject. Of course, *Villica*, *Dominula* and other allied species are well-known to be diurnal, and *caia*'s conspicuous colouring would suggest that it is for warning purposes, which would be of little effect at night.—C. NICHOLSON; 35, The Avenue, Hale End, Chingford, E. 4.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—January 25th, 1919.—The President, Mr. Stauley Edwards, F.L.S., in the Chair. Annual Meeting.—The Balance Sheet was adopted, the Report of the Council was passed, and the results of the election of Officers and Council for the ensuing year announced. The President read his annual address, and after a short *résumé* of the work of the Society and the progress of entomology generally for the past year dealt with the work that was being taken up on the economic side of entomology throughout the world. Votes of thanks were passed to Officers and Council. Ordinary Meeting.—Mr. Bunnet exhibited photographs of the details of the life-history of *Dasydera sulphurella*, and of some of the immature stages of the saw-fly *Phyllo-toma aceris*.—Mr. Tonge, a *Phigalia pedaria* taken at Reigate on November 24th last—the earliest date recorded.—Mr. Bowman, aberrations of *Cenonympha pamphilus*: (1) very pale; (2) very wide dark margins; (3) very dark suffused undersides; (4) ocellations on undersides much emphasised.—Mr. H. J. Turner, a series of *Polyommatus dolus*: (1) typical, from near Florence; (2) ab. *vittata*, from the Cevennes; (3) var. *menaleas*, from Asia Minor; (4) the series in the Society's (Freeman) collection. He also showed a small male *P. icarus* (22 mm.) from Elba, and *Pieris manni* with gen. *æs.*, *rossii* from the same place.

February 13th, 1919.—Mr. Stanley Edwards, F.L.S., President, in the Chair.—Mr. Ashdown exhibited some of the Coleoptera referred to in 'Ent. Record,' December, 1918, viz. *Mordella aculeata* and *Agrilus sinuatus*, new to Surrey, and the rare streaked ab. *hebreæ*

of *Anatis ocellata*.—Mr. Tatchell, *Vanessa io* with aberrant ocelli on hind wings, *Aglais urticae* ab. *connexa*, a large *A. urticae* ab. *versicolor*, and the beautiful Fossiliferous Hymenopteron, *Mutilla europaea*.—Mr. Turner, a long series *Lowria (Chrysophanus) alciphron* from various localities, including (i) type from Buda, (ii) *gordius* from the Alps, (iii) *granadensis* from Spain, (iv) ab. *intermedia* from Italy, (v) ab. *vittata*, (vi) *milibensis* from Bosnia, (vii) ab. *subfasciata*, and (viii) ab. *infuscata*.—Mr. R. Adkin, captured and bred specimens of *Ditrypetria abietella* from Forres, and read notes on the species asking for information on details of its life-history hitherto unknown.—Mr. A. W. Buckstone, bred series of *Vanessa io* from Surrey including ab. *cyanosticta*, and referred to various minor aberrations and variations in their markings. He also showed drawings, by the Rev. C. R. N. Burrows, of the genitalia of the dwarf and other races of *Agriades corona* recently discussed, and read the comments received with the sketches.—Mr. Bennett, details of the life-history of *Coleophora migricella*, and read notes on the mode of progression of the case-bearing larva with a series of photographs in illustration.—**Hy. J. TURNER, Hon. Editor of Proceedings.**

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Annual Meeting held at the Royal Institution, Colquitt St., Liverpool, December 16th, 1918.—Mr. Wm. Webster, President, in the Chair.—The reports of the Council, the Hon. Treasurer, and the Hon. Librarian were presented and adopted by the Meeting. The following were then elected as Officers and Council for the ensuing year, viz. President, Richard Wilding; Vice-Presidents, Wm. Webster, F.R.S.A.L., S. P. Doudney, Dr. G. B. Longstaff, M.A., F.E.S.; Hon. Treasurer, Dr. John Cotton; Hon. Librarian, F. N. Pierce, F.E.S.; Hon. Secy., Wm. Mansbridge, F.E.S.; Council, Dr. P. F. Tinne, M.A., J. W. Griffin, H. F. Carter, F.E.S., Dr. E. A. Cockayne, M.A., F.L.S., W. A. Tyerman, Wm. Buckley, Prof. R. Newstead, M.Sc., F.R.S., G. F. Mathew, F.L.S., Leonard West, Capt. A. W. Boyd, M.C., F.E.S., Dr. A. Randell Jackson, and W. J. Lucas, B.A., F.E.S.—The President read an address in which he dealt with the folk-lore of insects and other creeping things. Many interesting superstitions and tales were discussed. The address will be printed in the Society's Report, and together with the same author's paper in the 1903 Report will form a very full account of this interesting subject.

January 20th, 1919.—Mr. S. P. Doudney, Vice-President, in the Chair. Mr. W. A. Tyerman read a paper dealing with his captures of Microlepidoptera during 1917 and 1918 in the Liverpool district. This interesting paper enumerated 211 species, many of them not having been recorded for S.W. Lancs. since the publication of the Ellis List in 1890; this good result is probably owing to much of the author's collecting having been done in places seldom visited by others. *Anacampsis alnopalpella*, a single specimen taken at Formby, is an addition to the Lancashire and Cheshire fauna. Mr. Tyerman exhibited the collection, and was heartily congratulated upon the very useful work he had accomplished.—Mr. W. Mansbridge

then read a paper detailing his results in breeding *Aplecta nebulosa* and its varieties; he showed the different families obtained as the progeny of selected parents, and suggested how the black forms of the moth might arise in nature. He also stated that the percentage of black forms bred from wild larvæ obtained from a certain selected area had sensibly diminished in the last four years, while, so far as known, there was no increase in any other part of Delamere Forest. Observations extending over the last fifteen years were embodied in the paper.—Exhibitions: Mr. Leonard West had a collection of larval cases of the caddis fly, very curious forms of these little-known larval habitations being represented.

February 17th, 1919.—The President, Mr. Richard Wilding, in the Chair.—Mr. H. M. Hallett, F.E.S., read a paper entitled “Way-side Hymenoptera.” The paper described one of the author's favourite banks in Glamorgan, where in a short length of some thirty yards he had taken upwards of 150 species of Hymenoptera. The rarer species and their habits were noticed in some detail; the whole formed a most interesting account of the intensive study of the fauna of a limited area.—Dr. John Cotton followed with a short paper, illustrated by a series of lantern-slides, on the nest-building of *Odynerus*; the growth of the nest from the first cell to the completion of the full series and of the embryo from the ovum to the nymph were shown. Slides representing the imago at work, the larvæ with which the cells were stored by the parent wasp as food for its young, instances of parasitism, etc., combined to make a highly instructive address.—Exhibits were as follows, viz.: Mr. Leonard West, a water-colour drawing showing the life-histories of various Trichoptera.—Mr. W. A. Tyerman, *Eugonia erosaria* and *Agriopsis aprilina* from Eastham.—Mr. F. N. Pierce, *Cidaria minna* from Japan and Assain with *C. otregiata* for comparison.—Mr. W. Mansbridge showed a small selection of aberrations of *Peronea cristana* recently received from Mr. W. G. Sheldon.—WM. MANSBRIDGE, Hon. Sec.

REVIEW.

Observations relatives à la Biologie de Lycæna alcon. Lépidoptérologie Comparée, vol. xvi, Octobre, 1918. Imprimerie Oberthür, Rennes.

WHEN the posthumous volume of Tutt's ‘British Butterflies’ (iv) appeared in 1914 we were still in doubt as to the final larval and pupal stages of *Lycæna arion*. That ambiguity has been cleared up by the indefatigable perseverance of Mr. Frohawk, Capt. Bagwell-Purefoy, and Dr. Chapman. We knew *arion* as a true myrmecophilous species, and that it passes its winter life in the ants' nest. In the extract from ‘Lépidoptérologie Comparée,’ vol. xvi, now before us, much of the mystery attending the life-history of the closely allied *Lycæna alcon* is unveiled. To Dr. T. A. Chapman, following up the clues provided by M. Oberthür, and Mr. H. Powell of Hyères, we

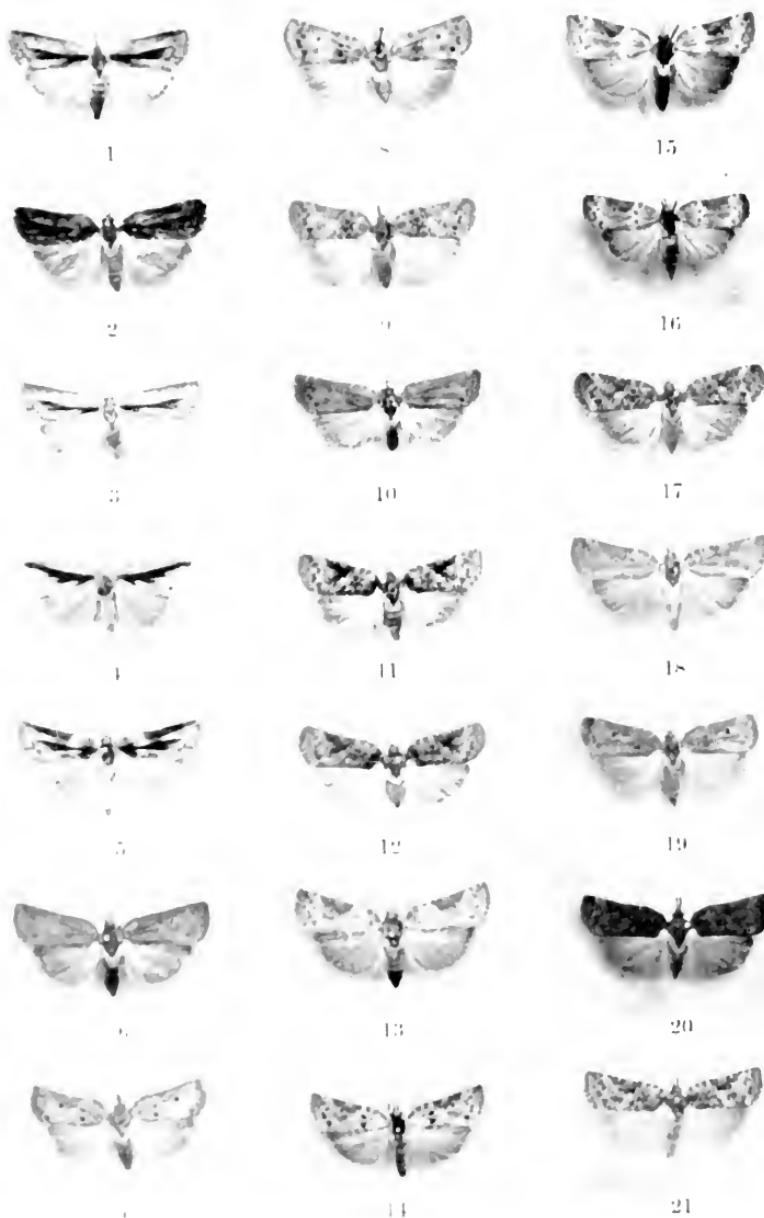
owe this important advance in our knowledge of the species. Dr. Chapman has established a universal reputation among lepidopterists by his researches and discoveries in the life histories of the Lycaenids among other groups. When Lang's 'Butterflies of Europe' was published in 1881, of over a hundred of the described species of western palaearctic Rhopalocera the life-histories were pronounced unknown, and, of those described, many were sketchy in the extreme, or based on guesswork of the most obvious kind. In the "blue" genera, lumped together under *Lycæna*, seven and twenty were included in this category. Dr. Chapman has attacked the "alpines" with his entomary vigour and success. His observations, and those of other scientific workers, have reduced the "wholly unknowns" by more than half, and to him, with other British entomologists, belongs the lion's share of the credit.

The association of *L. alcon* of the Bretagne "landes" with ants had long been suspected by M. Oberthür, following upon the discoveries in connection with *L. arion*. In September, 1917, therefore, with the assistance of two of his grandsons and Mr. Powell he traced the exodus of the young *alcon* larva from the flowers of its food-plant, *Gentiana pneumonanthe*, and its reception into the nests of two ant species, *Tapinoma erraticum* and *Tetramorium cæspitum*. Their observations, and the deductions drawn therefrom by M. Oberthür and Mr. Powell, are contained in the two papers immediately preceding Dr. Chapman's—"Observations relatives à la Biologie de *Lycæna alcon*" and "Compte Rendu de la Recherche des Chenilles de *Lycæna alcon*" (*op. cit.*, pp. 269-276). Mr. Powell also established the further fact that the larva would imbibe the fluids of ant pupæ. With this to work upon Dr. Chapman received larvae from Rennes in the third instar which he installed in observation nests of *Myrmica scabrinodis*, and he gives us, in minute detail, the results of the experiment from September 9th, 1917, to August 2nd, 1918, when the sole survivor, a male, emerged, being the first imago of *alcon* ever bred under artificial conditions. This example had pupated in the nest on July 10th. We cannot enter here with more particularity into the extraordinarily interesting account of the treatment of guest by host. Dr. Chapman has proved beyond doubt that the bionomics of *alcon* are quite parallel with those of *arion*, but with this amazing difference: *Alcon* leaves the food-plant in its third instar—to all appearances an ordinary third-stage Lycaenid larva. "Like *arion*, however," he writes, "it undergoes no further moult, and presents the remarkable and, I believe, unique character of a Lycaenid larva that has only two moults (three instars)."

Dr. Chapman's paper is accompanied by six photographic plates illustrating the ova, larva, larval skin, and pupal integumenta. To all concerned with this epoch-making contribution to our knowledge of the symbiosis of the Lycaenid and the ant we offer our warmest congratulations.

H. R.-B.





ADDITIONS TO THE COLLECTION OF *Salrothrius revayana*.

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[No. 672

THE VARIATION OF *SARROTHRIPIUS REVAYANA*, SCOPOLI.

By W. G. SHELDON, F.Z.S., F.E.S.

(PLATE I.)

THE geographical distribution and range of this polymorphic species is at present very imperfectly known, because, although it almost certainly is found over practically the whole of the palaeartic area, with the exception of the Arctic regions, there are forms inhabiting India and America which do not seem separable from it. For this reason any attempt to deal with the subject of its variation that I am able to make can only concern European forms, and more especially those which are found in the British Islands.

S. revayana in our country assumes about thirty fairly distinct forms, and there are one or two others which occur in the surrounding Continental areas, but which are not found with us. Of these, thirteen have had names given to them, the remainder, up to the present time, being without any.

The authors of these names, or most of them, considered they were naming distinct species and not forms of one species; but unfortunately the bulk of the subsequent writers in discussing these forms have not taken the trouble to refer to the original descriptions. Consequently the nomenclature of the whole is at present involved in confusion.

It is to correct these errors and to try to understand the general aspects of the variation that the present paper is written.

The most ambitious attempt to deal with the variation of a British Lepidopteron is probably the monograph of the late J. A. Clark on *Peronea cristana*, which is to be found in the 'Entomologist's Record,' vol. xiii, pp. 227-229, 261-265, and 287-293. *P. cristana* has gone very far towards producing a number of subspecies, the forms being remarkably constant and clearly defined, and intermediate specimens comparatively rare. This is not the case with *S. revayana*, for although some

of the forms are distinct, and without, so far as I am aware, intermediates being known, there are others which grade into each other in a remarkable way, so that it is often impossible to say with which of two forms a particular specimen should be placed. This of course adds very greatly to the difficulty of tabulating the variation.

The forms divide themselves into two divisions, so distinct that if the earlier stages were not known, one would at once follow the example of the lepidopterists of a hundred years ago and class them as distinct species.

The first of these divisions comprises those handsome and striking forms which are known popularly as "streaks"—that is to say, those with a longitudinal black streak on the superiors. This division includes the type *revayana*, Scop., and ab. *ramosana*, Hüb., and *stoninus*, Curtis.

The second division, which comprises the great bulk of the known forms, has certain peculiarities which pertain to all of them to a greater or less degree. The most prominent and important of these is unquestionably a large blotch on the costal region of the superiors; this blotch, which is always darker in colour than the surrounding area, occupies the central costal margin for about one-third of its length; it extends ordinarily in a triangular shape to the centre of the wing, and in this form it is most pronounced in ab. *afzeliana*, Swederus, or it may continue as a fascia across the wing to the inner margin, as in ab. *bifasciana*, Donovan.

Another striking character in this group is a black or red-brown discoidal spot in the centre of the superiors. This is present in the great majority of the forms, but not in every one. A third characteristic is a double series of fuscous spots or blotches, somewhat smaller than the discoidal spot, which cross the superiors transversely; one of these is about one-third of the length of the wing from the base, and the other is near the hind margin. Most of the forms have also two or more dark fuscous lines which cross the superiors transversely.

For convenience of classification and arrangement I subdivide this division into four groups, which I call respectively the *dilutana*, Hüb., *afzeliana*, Swederus, *undulana*, Hüb., and *degenerata*, Hüb. groups. In the case of each of the forms that have been already described I give the original description, with, in one or two cases, the English translation.

S. revayana is in Britain a widely-distributed species, occurring throughout as far north as Ross; it is found also in Ireland. By far the greater number of specimens in our collections hail, however, from the New Forest, where the species is usually somewhat abundant. In this district it is, moreover, more variable than in many others, in which the duller-coloured forms alone are to be found.

If an extensive series of British specimens is compared with an equally extensive series from another country, it is seen at once that although the main lines of variation are the same, the actual specimens vary—that is to say, an example of a given form from Britain will show certain well-marked and fairly constant differences from an example of the same form from France or Germany. These, again, will show differences from the same form from Scandinavia or Russia. Consequently we may say that a great number of the British forms are not exactly reproduced elsewhere.

DIVISION 1.

Revayana, Scopoli.

Synonymy.—*Revayana*, Scopoli, Ann. Syst. Nat. v, p. 116 (1772); Schiffermüller, Syst. Verz. p. 130 (1776); Fabricius, Ent. Syst. iii, p. 266, No. 101 (1793), *rivagana*; Duponchel, Hist. Nat. Lep. ix, p. 46 (1834); Treitske, Schmett. von Europa, viii, p. 22 (1830); Eversmann, Fauna Volga Ural, p. 481 (1844); Herrich Schäffer, Sys. Bear. Schmett. Europa, ii, p. 445 (1845); Heinemann, Schmett. Deutch and Schweiz, p. 618 (1859); Wilkinson, Brit. Tort. pp. 12–13 (1859); Stainton, Manual, ii, p. 190 (1859); Staudinger, Cat. Lep. d'Europa, p. 22 (1861); Sepp, Ned Ins. 2nd series, i, p. 147 (1862); Staudinger, Cat. Lep. d'Europa, p. 50 (1871); Frey, Lep. Schweiz, p. 72 (1880); Aurivillius, Nord. Fjär. p. 80 (1891), *revayanus*; Meyrick, Brit. Lep. p. 35 (1895); Staudinger, Cat. Pal. Lep. i, p. 361 (1901); Buckler's Larvae, ix, pl. cli, fig. 4, and p. 326; South, Moths Brit. Isles, i, p. 146 (1907); Hofmann, Schmett. Europas, ii, p. 124 (1908), *revayanus*.

Original Description.—“*Phalaena revayana*. Diagn. Tortrix ; alis superioribus glauco virentibus, margine exteriore notabiliter curvo.

“Alæ anticae longitudine lin. 4–5. Pagina inferior concava, fuscis lineis longitudinalibus. Alæ posticæ supra fuscescentes ; venis obscurioribus, margine albo.” (Scopoli, ‘Annus Historico Naturalis,’ vol. v, p. 116 (1772).)

It was only after considerable study of this description that I realised Scopoli's meaning. At first it did not seem reconcilable with any known form of *S. revayana*, and especially with the supposed type form ; for although I discovered that since his day writers had variously diagnosed the type, they had nearly all agreed in describing something which did not fit in with Scopoli's description. The majority considered it to be an insect with light grey superiors, crossed transversely by several dark fuscous, waved lines ; and I find that this is the impression of the majority of lepidopterists at the present day.

Obviously this description does not agree with Scopoli's “fuscis lineis longitudinalibus,” and the only and obvious solution of the puzzle that I can see is, that Scopoli described a specimen

similar to the well-known ab. *ramosana* of Hübner, but which had "greenish-grey" ground-colour of the superiors instead of the brownish-grey which obtains in Hübner's figure.

I have not seen a British specimen with this "greenish-grey" ground-colour, but an occasional one does occur in which the red-brown is so slight that the general tone appears grey. Mr. Bright has two of these, and I have seen one or two others. I may observe that Hübner's figures of ab. *ramosana*, 'Vögel,' pl. lxxv, and 'Tort.' pl. ii, fig. 10, have the wings distinctly less brown than is the case in the great majority of British examples of this form.

ab. *ramosana*, Hübner.

Synonymy.—Ab. *ramosana*. Hüb., Vög. lxxv (1793); Hüb., Tort. fig. 10 (1797); Curtis, Brit. Ent. pl. xxix (1824), *ramosanus*; Curtis, Guide, p. 174 (1829), *ramosanus*; Stephens, Cat. ii, p. 184 (1829), *ramosanus*; Treitske, Sch. von Europa, viii, p. 22 (1830); Rennie, Conspectus, p. 175 (1832), *ramosanus*; Stephens, Haust. iv, p. 147 (1834), *ramulanus*; Wood, Index Ent. fig. 1046 (1839), *ramulanus*; Humphreys and Westwood, Brit. Moths, ii, pl. xci, fig. 16, and p. 152 (1845); Staudinger, Cat. Lep. d'Europa, p. 22 (1861); Sepp, Ins. Ned. 2nd series, vol. i, p. 147, and pl. xxxiv, fig. 29 (1862); Staudinger, Cat. Lep. d'Europa, p. 50 (1871); Frey, Lep. Schweiz, p. 72 (1880); Aurivillius, Nord. Fjär. p. 80, and fig. 16 (1890); Favre, Macro-Lep. de Valais, p. 78 (1899); Barrett, Brit. Lep. vi, pl. celi, fig. 3 (1900); Staudinger, Cat. Pal. Lep. i, p. 361 (1901); South, British Moths, i, p. 147 and fig. 23, No. 5 (1907).

Original Description.—*Phalæna tortrix ramosana*. This aberration was figured and named by Hübner; there is no description, but I have made one from his figure, 'Vögel,' pl. lxxv, as follows:

Superiors brownish-grey, with dark fuscous longitudinal branched streaks and discal spot.

Thorax and head dark brownish-grey; hind wings dark fuscous.

Hübner's figures in 'Vögel,' pl. lxxv, and 'Tort.' pl. ii, fig. 10, have the ground colour of the superiors with much less of the reddish-brown tint than our British examples, and they are thus nearer the type form.

This well-known and handsome form is not infrequent in the New Forest, and possibly represents 2 or 3 per cent. of the specimens captured there; it also occurs in other localities. Curtis records it from Richmond and Dartford Heath, and Stephens and Wood from Darenth. These of course are all old records, and I am not aware of any recent ones except from the New Forest. In Britain it varies considerably in the depth of the ground colour, and in the amount of black in the longitudinal streaks.

I have figured an average British example of this form

(Fig. 1), so that the next two modifications of it can be compared with it.

ab. *atrata*, n. ab. (Pl. I, fig. 2.)

In this aberration the ground colour is darker than in ab. *ramosana*, and the black streaks and shading cover almost the whole of the superiors.

This is the darkest of the ab. *ramosana* forms. I have two examples captured in the New Forest in 1917. Probably, in view of the gradual darkening of many species of British Lepidoptera, it represents a recent development, and may be expected to become more frequent and pronounced in the future.

ab. *cladodes*, n. ab. (Pl. I, fig. 3.)

Synonymy.—Barrett, Brit. Lep. vi, pl. ccli, fig. 3c.

Description.—Under this name I include those forms of ab. *ramosana* which are paler than the type.

Barrett's figure is an extremely light form; probably it represents the extreme xanthism of this aberration in Britain.

ab. *sagittata*, n. ab. (Pl. I, fig. 4.)

This aberration has the ground colour of the superiors grey; the streak, which the figure gives the shape of, is dark fuscous; head, palpi and antennæ are grey; the thorax is grey with a few fuscous scales.

This is an exceedingly rare form, of which I have only seen two or three specimens. The type is in the collection of Prof. Image, to whom I am indebted for kind permission to figure and name it.

A form very similar to this was figured in Westwood, 'British Moths,' vol. ii, pl. xci, fig. 17, but the specimen depicted has a red costa and hind margin to the superiors; Westwood's plates, however, are so poorly executed and different in various copies that one cannot rely upon this distinction; it is described on p. 152 of the same volume ab. *stonanus* = ab. *stoninus* of Curtis, which it certainly is not. This specimen was taken at Birchwood.

ab. *stoninus*, Curtis. (Pl. I, fig. 5.)

Synonymy.—ab. *stoninus*, Curtis, Guide, p. 203 (1829); Stephens, Cat. Brit. Ins. vol. ii, p. 184 (1829), *stonanus*; Rennie, Conspectus, p. 175 (1832), *stonanus*; Stephens, Haust. iv, p. 147 (1834), *stonanus*; Curtis, Brit. Ent. 2nd edit., No. 29 (1840); Westwood, British Moths, ii, pl. xci, fig. 17, and p. 152 (1845), *stonanus*.

Original description.—ab. *stoninus*. Superior wings brown with a black branched stripe, and a waved fuscous striga across the disc. Curtis, 'British Entomology,' No. 29, 2nd edition (1840).

There is a good deal of confusion in connection with this aberration. The only author who purports to figure it is Westwood, but his figure does not agree with the description of either himself or Curtis, inasmuch as there is no indication in it of the "waved fuscous striga" referred to. Then, again, there was a specimen which some years ago was in the collection of the late Dr. Mason, and which from him passed to the late J. A. Clark; this specimen was supposed to be Curtis's type of ab. *stoninus*, and it is so referred to in the 'Entomologist's Record,' xxii, p. 21.

It is the one which I have figured, Pl. I, fig. 4, as the type of ab. *sagittata*, and it is now in the possession, as before stated, of Prof. Image, for whom it was secured at Clark's sale. Now as this specimen is not *stoninus* at all, and as, moreover, Curtis's 'Guide' (both editions), in which he made a mark against those forms or species which he possessed, shows that he did not at the time the 'Guide' was written—1829 and 1841—possess a type of ab. *stoninus*, and as Mr. J. A. Kershaw, the Director of the National Museum at Melbourne, assures me there is no type of ab. *stoninus* in the collection now, and moreover there is no pinhole even above the name, obviously Curtis never possessed a type.

ab. *stoninus* occurs regularly but rarely in the New Forest. Mr. South has three or four examples from there; Mr. Bright also has several. In September, 1916, I took the specimen figured, at Brockenhurst, but it is the only one I have seen out of four or five hundred examples of the species examined.

DIVISION 2.

Dilutana Group.

In this group the ground-colour is ashy coloured, with or without reddish-brown cloudings.

ab. *dilutana*, Hb.

Synonymy.—Ab. *dilutana*, Hb. Tort. ii, fig. 6 (1797); Haworth, Lep. Britt. p. 406 (1811); Curtis, Brit. Ent. xxix (1824), *dilutanus*; Curtis, Guide (1829), p. 174, *dilutanus*; Stephens, Cat. ii, p. 184, No. 7037 (1829), *dilutanus*; Treitske, Schmet. von Europa, viii, p. 22 (1830); Rennie, Conspectus, p. 175 (1832), *dilutanus*; Stephens, Haust. iv, p. 146 (1834), *dilutanus*; Westwood, Brit. Moths, ii, pl. xci, fig. 13, p. 152 (1845), figured as ab. *lathamianus*; Duponchel, Hist. Nat. Lep. ix, p. 48, and pl. cxxxvii, fig. 7 (1834); Staudinger, Cat. Lep. d'Eur. p. 22 (1861); Sepp, Ned. Ins. 2nd series, vol. i, p. 147, pl. xxxiv, fig. 17 (1862); Staudinger, Cat. Lep. Eur. p. 50 (1871); Frey, Lep. Schweiz. p. 72 (1880); Lampa, Tidsk. vi, p. 31 (1885); Auri-villius, Nord. Fjär. p. 80, fig. 15 (1890), *dilutanus*; Favre, Mac. Lep. Valais, p. 78 (1899); Staudinger, Cat. Pal. Lep. i, p. 361 (1901); Rebel, Lep. Balk. i, p. 271 (1903), ii, p. 286 (1904); Hofmann, Schmett. Eur. ii, p. 121 (1908).

Original description.—*Tortrix dilutana*. This aberration was figured and named by Hübner; there is no description. The following is one I have made from his figure:

Base of superiors reddish-brown, with darker outer margin; next to this is a grey transverse band, followed by another (central) transverse reddish-brown band, outlined by dark lines and shaded with longitudinal dark lines. The outer margin has a double dark line. The anal angle is grey, with a waved, transverse, dark-brown line in centre. The head is reddish-brown. Thorax reddish-brown with two dark brown spots. The hind wings are light fuscous.

The British ab. *dilutana* are usually more evenly coloured than Hübner's figure, with the darker bands and lines not so prominent. The form occurs generally wherever *S. revayana* is found; it is not uncommon in the New Forest.

ab. *fusculana*, Schmid.

Synonymy.—ab. *fusculana*, Schmid., corr. xxxix, p. 75 (1886); Wood, Index Ent. fig. 1042 (1839), *lathamianus*; Staudinger, Cat. Pal. Lep. i, p. 361 (1901); Hoffmann, Schmett. Eur. ii, p. 124 (1908).

Original description.—“Derselben am nächsten (*dilutana*), doch verschieden durch den schwanzen mit rostroth übergossenen mittelfleck und der schwarzen längstrieme von der flügelwurzel bis zu $\frac{1}{3}$ des innerverändes.” (Schmid., ‘Corr.’, xxxix, p. 75.)

The chief characteristic of this form is the black longitudinal streak at the base of the superiors extending along one-third of the inner margin. This streak is not confined to this form, or even to the ab. *dilutana* group, several of the others possessing it. ab. *fusculana* is equally abundant with its near ally ab. *dilutana* in the New Forest and elsewhere.

ab. *obsoleta*, n. ab. (Pl. I, fig. 6.)

This form is similar in every way to ab. *dilutana* except that it is without the dark base to the superiors, and the dark, transverse bands are not so well developed. It is not uncommon in the New Forest. The reddish-brown suffusion only shows in the figure as a slightly darker cloud extending over portions of the superiors.

ab. *lathamiana*, Swederus.

Synonymy.—ab. *lathamiana*, Swederus, K. Vet. Acad. nya Hand. tom. viii, p. 276 (1787); Gmelin, Linn. S.N. Edn. xiii, p. 2578, No. 1532 (1788); Donovan, Brit. Ins. vol. x, p. 85, and pl. cccvii, fig. 2, figured and described as *ilicana* (1801); Haworth, Lep. Britt. p. 407 (1811); Curtis, Brit. Ent. No. 29, *lathamianus* (1824); Curtis, Guide, p. 174, *lathamianus* (1829); Rennie, Conspectus, p. 175 (1832),

lathamianus; Stephens, Cat. ii, p. 181, 7039, *lathamianus* (1829); Stephens, Haust. iv, p. 146, *lathamianus* (1834); Wood, Index Ent. fig. 1043, figured as *dilutanus* (1839); Sepp, Ned. Ins. 2nd series, vol. i, p. 147, and pl. xxxiv, fig. 19, *punctana* (1862).

Original description.—“*Phalaena tortrix lathamiana*, Swederus. ‘Kong. Vet. Acad. nya. Hand.,’ tom viii, p. 296 (1787).

“Alis anticis pallide testaceis, base apiceque punctis elevatis nigris fasciculo centrali squamoso ferrugineo.

“Hab. in Anglia: Mus. D. Francillon.

“Desct. Corpus facie Pyr. *Ilicanæ* Fabr. sed duplo minus: caput et palpi supra nivea. Antennæ testaceæ. Alæ anticæ pallidi-testaceæ, basi sub ferrugineæ punctis 4 f. 5 elevatis nigris: in medio fasciculo ex squamis elevatis ferrugineis; versus posteriora punctis 5 elevatis nigris summo tamen apice ferrugineo.

“Posticæ argentes-cinereæ, ciliaris.

“Obs.—Variat colore obscurè testaceo et brunnea.”

It will be observed that this form was named by Swederus from a British specimen, or specimens, which at the time the description was made were in the collection of Francillon. I learn from the authorities of the Hope Museum at Oxford, in which Francillon's Collection—the oldest British collection extant—is at present, that there are now no specimens in the collection answering to Swederus's description.

This aberration is fairly common in most of the localities in which *S. revayana* is found. I have a considerable series from the New Forest.

ab. *ilicana*, Fab.

Synonymy—ab. *ilicana*, Fab. Sp. Ins. ii, p. 283 (1781); Gmelin, Ins. Lep. p. 2502, No. 830 (1788); Fab. Ent. Sys. iii, p. 266, No. 100 (1793); Hübner, Tort. pl. ii, fig. 9, *punctana* (1797); Haworth, Lep. Britt. p. 407 (1811); Curtis, Brit. Ent. No. 29, *ilicanus* (1824); Stephens, Cat. ii, p. 181, 7010, *ilicanus* (1829); Curtis, Guide, p. 203, *ilicanus* (1829); Treitske, Schmett. von. Eur. viii, p. 22, *punctana* (1830); Rennie, Conspectus, p. 175 (1832), *ilicanus*; Stephens, Haust. iv, p. 147, *ilicanus* (1834); Duponchel, Hist. Nat. Lep. ix, p. 470, and pl. cxxvii, fig. 8, *punctana* (1834); Wood, Ind. Ent. 1045, figured as *azebianus* (1839); Staudinger, Cat. Lep. d'Europe, p. 22, *punctana* (1861); Sepp, Ins. Ned. 2nd series, vol. i, p. 147, and pl. xxxiv, fig. 15, *undulana* (1862); Staudinger, Cat. Lep. d'Europe, p. 50, *punctana* (1871); Frey, Lep. Schweiz, p. 72, *punctana* (1880); Lampa, Tidskr. vi, p. 31, *punctana* (1885); Aurivillius, Nord. Fjar. p. 80 (1890); Favre, Macro-Lep. de Valais, p. 78, *punctana* (1899); South, Brit. Moths, vol. i, p. 117, and fig. 23, No. 4, *ilicanus* (1907); Hoffmann, Eur. Schmett. ii, p. 124 (1908).

Original description.—“*Pyralis ilicana* Fabricius, ‘Sp. Ins.,’ ii, p. 283 (1781).

“Alis anticis fusco cinereis, punctis fuscis, centrali solitario atro magno in hoc genere.

"Alæ anticeæ latæ fusco cinereæ fere viridatæ. Ante medium puncta duo approximata fusca, tunc punctum centrale solitarium atrum versus marginem posticum puncta duo sine tria approximata fusca. Margo ipse striga punctorum fuscorum. Alæ posticæ cinereæ.

"Habitat in Anglia."

Specimens that agree with Fabricius's description of ab. *ilicana* are rather infrequent with us, although the original example came from England. I have half a dozen, all from the New Forest.

ab. *notata*, n. ab. (Pl. I, fig. 7.)

Synonymy.—Sepp, Ned. Ins. 2nd series, vol. i, p. 147, and pl. xxxiv, fig. 18 (1862).

Description.—This aberration is similar in all respects to ab. *ilicana*, Fab., except that the ground-colour of the superiors is much lighter in tint, *i.e.* a light silvery, ashy-grey.

ab. *notata* is much more abundant in Britain than ab. *ilicana*; I have a long series from the New Forest.

ab. *nigripunctata*, n. ab. (Pl. I, fig. 8.)

Synonymy.—Westwood, Brit. Moths, ii, pl. xci, fig. 14, and p. 152, *ilicanus* (1845).

Description.—In this aberration the ground-colour of the superiors is reddish-brown; the discal spot, which is black, shows prominently against the red-brown ground-colour. There are waved slate-coloured lines crossing the superiors on each side of the discal spot; the head and thorax are slate-coloured.

ab. *nigripunctata* is distinctly not a common form; all the examples I possess or have seen come from the New Forest. I possess eight specimens.

ab. *rufescens*, n. ab. (Pl. I, fig. 9.)

Description.—Similar in all respects to the last except that the central spot, which is prominent and large in ab. *nigripunctata*, is either missing or very small and indistinct.

ab. *rufescens* occurs with ab. *nigripunctata* in the New Forest, and in about the same numbers as that form. I have not seen it from elsewhere.

ab. *brunnescens*, n. ab. (Pl. I, fig. 10.)

Description.—The superiors, thorax, head, palpi and antennæ are uniform dull brown, with indistinct fuscous transverse lines; the dark central spot is only indicated by a few red-brown scales.

I have only seen this aberration from the New Forest; it is rare even there. I have four examples which answer to the description.

ab. *bifasciana*, Don.

Synonymy.—*bifasciana*, Donovan, Brit. Ins. x, p. 86, and pl. ccclvii, fig. 3 (1801); Westwood, Brit. Moths, ii, p. 151, and pl. xci, fig. 11 (1845); Sepp, Ins. Ned. 2nd series, i, p. 147, and pl. xxxiii, fig. xiii (1862).

Original description.—“*Phalaena bifasciana*, Donovan, ‘Brit. Ins.’ x, p. 86, and pl. ccclvii, fig. 3 (1801). Anterior wings testaceous, with two whitish bands and four distinct undulated streaks and spots of black.”

Donovan's figure, although clear, and a good one from an artist's point of view, is, like so many of his figures, rather highly coloured, and one suspects it is rather more highly coloured than was the actual specimen which he intended it to represent: at any rate, I have never seen an example in which the “whitish bands” which he describes, are so prominent. The nearest approach to it in this respect which I know is in the collection of Mr. South. Donovan speaks of this form as “a very uncommon insect,” and so it is still, I have seen perhaps a dozen examples in all the collections I have gone through. I possess three which I bred from a number of larvæ obtained in the New Forest in 1917.

EXPLANATION OF PLATE I.

- | | |
|----------------------------------|-------------------------------|
| 1. ab. <i>ramosana</i> , Hb. | 12. ab. <i>adusta</i> . |
| 2. ab. <i>atrata</i> . | 13. ab. <i>canescens</i> . |
| 3. ab. <i>claudodes</i> . | 14. ab. <i>lichenoides</i> . |
| 4. ab. <i>sagittata</i> . | 15. ab. <i>fasciata</i> . |
| 5. ab. <i>stoninus</i> , Curtis. | 16. ab. <i>depicta</i> . |
| 6. ab. <i>obsoleta</i> . | 17. ab. <i>albimaculata</i> . |
| 7. ab. <i>notata</i> . | 18. ab. <i>plumbea</i> . |
| 8. ab. <i>nigripunctata</i> . | 19. ab. <i>melanosticta</i> . |
| 9. ab. <i>rufiscens</i> . | 20. ab. <i>nigricans</i> . |
| 10. ab. <i>brunne-cens</i> . | 21. ab. <i>rosea</i> . |
| 11. ab. <i>variegata</i> . | |

(To be continued.)

ON SOME NORTH-COUNTRY SPECIES AND FORMS OF LEPIDOPTERA.

By J. J. LISTER, F.R.S., F.E.S.

Atra, beata Petamus arva!

(Concluded from p. 88.)

The first of our species that we hit on was *Cænonymphia tiphon* var. *landion*, Bork., a very different insect from var. *philoxenus*, which we left at Witherslack. It is much paler, especially in the female, and has indeed very much the colouring of *C. pamphilus*. The ocellation, instead of being boldly marked

and extending the whole gamut, is here confined in the male to two or three small or obsolete spots, sometimes with a black centre, and hardly appearing on the upper surface, and it is very little more marked in the female. The ground colour of the under side of the hind wing is here ash-grey throughout.

We found it at about 1700 ft. level (Kinloch-Rannoch is nearly 700 ft. above the sea) beyond the bifurcation of the Allt Mohr, the streamlet which comes down the hill-side just to the north of the village, and we met it again, though never abundantly, at about the same level at two or three points on the south of the loch, about the Allt Druidhe, and further west. The only food-plants mentioned by Tutt are *Rhynchospora alba* and *Festuca elatior*.

Laidion is the "British Northern form" of Dr. Buckell. His conclusions on the characters and nomenclature of this and the other varieties of *tiphon* have been in the main accepted by Mr. Rowland-Brown in the admirable and beautifully illustrated Study of this species, which he contributed to the 'Études de Lépidoptérologie Comparée' of M. Ch. Oberthür (Fascicle vii, Rennes, 1913); and to this work we owe a great increase in our knowledge of the range of its three forms in the British Islands. He finds that *laidion* extends from the Orkneys and Lewis, and the extreme north of the mainland of Scotland to Perthshire on the east, and as far as Loch Lomond in the west.

The third form referred by Dr. Buckell to type, *C. tiphon*, Rottemburg, and called by him the "British Middle Form," occurs in Arran and the south-western counties of Scotland, across the Border Country (Morpeth, Penrith, Carlisle), and down the moorlands on the east coast, through Durham and Yorkshire to Thorne Waste, north-east of Doncaster, and to the neighbourhood of Rotherham, thus extending almost as far south on the east side of England as does *philoxenus* on the west side. It appears again in N. Wales (Merionethshire) and over nearly the whole of Ireland. The ocellation is intermediate between that of the two other forms.

I have three specimens of this form which I took above Richisau, in the Klöntal (Glarus), in 1914, at an elevation of about 4300 ft.—over 1000 ft. higher than the highest Swiss locality given by Wheeler, namely, that recorded by Rowland-Brown "below Andeer, which is 3210 ft. It does not appear, therefore, that altitude is, as Dr. Buckell surmises, a determining factor, any more than temperature.

The distribution of the varieties of *tiphon*, so distinct in Great Britain, appears not to have been worked out for the continental forms. In his introductory remarks to Mr. Rowland-Brown's Study M. Oberthür says: "Il s'agit encore de comparer ces trois formes à celles existant sur le continent, et de constater si elles y sont bien semblables aux formes insulaires et s'il ne se trouve

pas des formes continentales inexistantes en Angleterre, Ecosse et Irlande" (p. 5).

Erebia epiphron occurred in the Rannoch district in very much the same localities as *C. tiphon*. We found it up the Allt Mohr at a slightly lower level and on the south side of the loch at about the 1600-ft. level. On ascending the hill-side we met a few before the upper level of the bracken was reached, but they became more abundant some 200 or 300 ft. higher. Our best ground was a shelving grassy terrace among the heather at about this level just east of the Allt Druidhe, where tracts of *Myrica gale* and a low growth of *Salix caprea* formed features.*

This species is not quite so dependent on sunlight for its activity as *tiphon*, as even after the sun had become hidden one could take a few on the wing. It seemed to extend very little higher up the hill-side than the terrace mentioned—at least on the one occasion on which I tried to ascertain the upper limit of its distribution.

Both the Lake Country and the Rannoch forms of *epiphron* appear to belong to the variety *cassiope*, Fab., though, as set forth by Tutt,† there are marked differences between them. The rusty spots stand out more conspicuously in the latter, and this is partly due to their being slightly yellower (less rusty), and partly to the fact that the dark ground colour of the wing is maintained at a nearly uniform depth to the margin, instead of somewhat paling off towards the margin.

The average expanse across the wings in twenty-two Lake district specimens is 31·13 mm., in twenty from Loch Rannoch 33·35 mm.—a difference of 2½ mm.

I am inclined to agree with Tutt that the fore wings are narrower in the former. But although these differences are noticeable when whole series from the two localities are compared, there are, as he says, among them examples which it would be difficult to assign to either locality if they were unlabelled.

A. medon var. *artauverres*. Our hunting-grounds for this species were the ravine of the Allt Mohr just above the village, and a meadow bordering the road to the east of Drumchastle Wood some 1½ miles down the valley. In both there was shelter from the prevalent westerly winds. It is a charming little insect with its clean white discal spots on the fore wing, and all the more interesting to us after making the acquaintance of *salmaeis* on our way north. If it had not been for the signal flag of the *Helianthemum* flowers we might have searched for it in vain.

* Here is a list of the common plants which I collected on this terrace : *Ranunculus repens*, *Polygonum vulgaris*, *Potentilla tormentilla*, *Galium saxatile*, *Caluna vulgaris*, *Erica tetralix*, *Pinguicula vulgaris*, *Salix caprea*, *Myrica gale*, *Gymnadenia conopsea*, *Juncus squarrosum*, *Scirpus cespitosus*, *Carex pilulifera*, *C. binervis*, *Nardus stricta*, *Anthranthus odoratum*, *Agrostis canina*, *Aira cespitosa*, *Molinia cornuta*, *Festuca ovina*.

† "British Butterflies," pp. 425-6.

P. icarus. We found some interesting forms of the female of the northern form of this species.

E. antiopa. "What's hit's history; what's missed's mystery." Nevertheless the evidence that a specimen of *antiopa* was seen by Mrs. Keynes appears to me so convincing that I propose to give it. On July 6th, when we met at lunch, Mrs. Keynes, who had been for a short distance up the path by the Allt Mohr, told us that she had seen "a large dark butterfly with pale borders to the wings," reminding her of the Camberwell Beauties she had seen in Switzerland. She had tried to capture it, but it had evaded the net. It so happened that the morning's post had brought the July number of the 'Entomologist,' and on opening it after lunch we found (p. 160) that three specimens of *antiopa* had been taken at Kinloch-Rannoch in May (1918), and three others elsewhere in Scotland, in April and May. I have since learned that Dr. A. H. Foster acquired one of these specimens, a female, alive, and sent it to Mr. Newman in the hopes that a brood might be reared. Unfortunately, though eggs were laid they were unfertile. It appears to me highly probable that the specimen seen by Mrs. Keynes was the offspring of or possibly a survivor of the spring migrants.

A. aglaia was plentiful on the lower slopes of the hills and *B. selene* not uncommon.

I left on Friday, July 12th, to return to Witherslack for the emergence of *P. aegon* var. *masseyi*. I propose to reserve what I have to say on this species for a future occasion, and will now only point out what I believe to be an error in the record of its distribution in Tutt's 'Natural History of British Butterflies,' vol. iii, pp. 203 and 229. It is there stated that "it was first recorded from these mosses [on the Westmorland and Lancashire borders] by Hodgkinson, who captured it at Witherslack on July 21st, 1856, and then in profusion on July 14th-15th, 1861, at Whitbarrow Scar . . ." Before I arrived at Witherslack it had struck me as very remarkable that a peculiar form found on peat mosses should also occur on a hill 700 ft. high, and the impression was emphasised when I was there and saw Whitbarrow with the appearance described at the beginning of this paper. Having found the insect in abundance on the low ground I visited Whitbarrow and, with the courteous permission of Mr. Wm. Farrer, in whose property it is included, explored the top of the hill, in company with Mr. A. H. Pearson, another collector. This was on July 16th, within a day of the date of Hodgkinson's find fifty-seven years earlier—a fine sunny day, and we spent several hours traversing the southern two miles of the top (which is the part locally called "The Scar"), along many lines. We obtained fine views of the Langdale Pikes to the north and of the Kent to the east—but no

trace of *ægon* did we find. Whitbarrow is indeed a typical, dry, fissured limestone hill, the strata dipping to the east and south-east, so that the top presents a series of dry grassy terraces alternating with sheets of loose, broken fragments of the rock, marking the outerops of the strata. These give the white, bald appearance of the top when seen from the south. Parts of the top are occupied by plantations, and a considerable area has recently been planted and enclosed by a high wire fence to keep out the deer. Of course we found no trace of a peat-moss up here, and, indeed, the conditions are such as to exclude the possibility of peat formation.

With the kind assistance of Mr. Stanley Edwards I have, since my return, found the reference to Hodgkinson's paper on which the record is founded. It is in the 'Entomologist's Weekly Intelligencer,' 1861, p. 139. He says that he started on July 14th to visit Whitbarrow Scar, and gives a list of the species taken on this and the following day. The only butterfly mentioned besides *P. ægon* is *Cenonympha dorus* which we now call *C. tiphon*.

Now Hodgkinson, though an excellent entomologist, was at very little pains as to the form in which he recorded his observations : and while the reader might at first sight conclude that the insects recorded were all found on Whitbarrow Scar, I am inclined to think that what Hodgkinson set out to do was to put on record the species he had obtained on his whole expedition, which had the Scar (and the coveted *Agrotis ashworthii*) as its ultimate object. His home was, I understand, in Preston, Lancashire, and he would probably go by rail to Grange—the line to Ulverstone was, I learn from Mr. Davis Ward, opened in 1857—and on his way to Whitbarrow he would be most likely to visit Witherslack Moss, on which he had taken *ægon* five years before, and which, as we have seen, is also the home of *C. tiphon*. That both these species, so strictly limited (unless we accept Hodgkinson's record at its face value) to peat country, should have been found, and together, 700 ft. up on a dry limestone hill appears *a priori* most improbable, and the fact that Mr. Pearson and I failed to find them there, under ideal conditions of date and weather, is, for me at least, additional evidence in favour of erasing the references to Whitbarrow Scar from the record of the distribution of *ægon* from pp. 203 and 229 of Tutt's invaluable work.

On our last day (July 17th) at Witherslack I went to Arnside Knott, in company with Mr. Davis Ward on the chance of finding *E. atthiops* on the finely wooded top of the hill. We were, however, too early for it. A few weeks later I had the pleasure of receiving from him a good series of this beautiful insect, which I have not taken in Britain. Not even in the New Forest have I seen *A. adippe* in such profusion as it is at this locality. I have already described the occurrence here of *A. medon* var. *salmacis*.

During the long spells of cloudy weather while waiting for gleams of sun, and on other occasions, I turned my attention to such Geometers as came to hand, and though I have very little acquaintance with this family of moths, my results may be of some interest.

Acidalia fumata. Two specimens from Witherslack and one from Loch Rannoch.

Ortholitha plumbaria. Two from the bracken area on the lower slopes round Loch Rannoch.

Odezia atrata, the Chimney Sweep. Flying in bright sunlight on the slopes at the foot of the Langdale Pikes and near the south shore of Loch Rannoch.

Anaitis plagiata. Not uncommon at Witherslack, Arnside, and elsewhere.

Lobophora sexalisata, the Small Seraphim. Although the English name might imply that it does not occur singly, I only took one specimen of this pretty little moth, among the bracken, near the south shore of Loch Rannoch. South says that it "has been recorded from some of the northern counties," so perhaps this is unusually far north for it.

Cidaria immanata was common on the sheltered sides of rocks from the shores of Loch Rannoch up to 1000 ft., and on the trunks of trees in the Black Wood. One of my specimens is a fine example of the var. *marmorata*, Haworth, with the central band of the wing white.

Coremia munitata, the Red Carpet, was represented by one specimen from rocks on the *epiphron* ground by the Langdale Pikes.

Amæbe viridaria, the Green Carpet, occurred on rocks at Esk Hause. My last locality was the trunks of beeches in the New Forest.

Malenysdris salicata, the Striped Twin-spot Carpet, was plentiful among the heather near the top of Beinn à Chuallaich, at about 2500 ft., July 4th.

Entephrya cæsiata, the Grey Mountain Carpet, occurs with *Cidaria immanata*.

Xanthorhoë montanata, the Silver Ground Carpet, rose from the heather on the hill-sides about Loch Rannoch, and is common also round Cambridge. The same may be said of *X. galeata* and *sociata*. I took one example at Loch Rannoch of *X. tristata* (the Small Argent and Sable), and the Yellow Shell (*C. bilineata*) flew out in crowds from ferns in the gully of the Allt Mohr.

Of the Boarmiinæ, *Cabera pusaria*, the Common White Wave, occurred at Witherslack and Loch Rannoch.

Semiothisa liturata, the Tawny Barred Angle, was found on Meathop Moss on June 25th and 27th.

Boarmia repandata from the Black Wood of Rannoch.

Gnophos myrtillata, the Scotch Annulet. I took two of this

attractive species in bright sunlight by the Allt Mohr, one on the wing and one just as it was settling down flat on a rock. A second or so later and I should certainly have passed it over, so closely does it resemble a patch of one of the dark incrusting lichens common on the rocks. Its distribution in Scotland is from the Clyde northwards.

Ematurga atomaria, the Common Heath, was common on the Witherslack mosses and in Scotland. Some of the females have wings so small as to suggest that they may be moving towards the apterous condition characteristic of many of their sex among Geometers.

Bupalus piniaria, the Bordered White. I took several males and a female about the north end of the pine wood on Meathop Moss, the males all showing the white ground colour on the upper-side of the wings, in contrast with those (*ab. flavescens*) from the New Forest and in the South of England generally, in which it is yellowish.

Selidosoma ericetaria, the Bordered Grey. This local species is represented by three specimens from Witherslack Moss, July 14th and 15th.

Thamnonoma wanaria, the V Moth, comes from Kinloch-Rannoch, and I had the pleasure of taking *Th. brunneata* (the Rannoch Looper) in the Black Wood, the locality from which it was originally described, though it occurs northwards from Perthshire in Scotland, as well as in Northern and Central Europe.

Perconia (Aspilates) strigillaria, the Grass Wave, was very abundant on Meathop Moss, and is widely distributed in Great Britain.

In conclusion, I should like to express my cordial thanks to Mr. J. Davis Ward, of Grange-over-Sands, for the repeated help and kindness which he showed me, a complete stranger to him; to my friend Mr. A. G. Tansley, F.R.S., for supplying an authentic reference on the Black Wood of Rannoch; to Mr. F. G. Whittle for information as to ways and means at Kinloch-Rannoch; to Mr. Stanley Edwards, of the South London Entomological Society, for his assistance in finding Hodgkinson's reference (though I am not sure that he will agree with my conclusions); and to my sister, Miss G. Lister, for her help in determining the species of my collections of plants.

Merton House,
Grantchester,
Cambridge.

NOTES ON BRITISH ODONATA, 1918.

By W. J. LUCAS, B.A., F.E.S.

AT Marlborough Deep in the New Forest on April 27th I met with the first dragonfly of the season. It was an Agrionid, and no doubt *Pyrrhosoma nymphula*, Sulz., though I had not the chance of certainly identifying it. On the previous day E. A. C. Stowell took a single example of this species near Par, in Cornwall, and on May 14th he found quite a number at Par swamp. On June 1st he took a *Cordulegaster annulatus*, Latr., and both sexes of *Calopteryx virgo*, Linn., at Lostwithiel in the same county.

In June, *Calopteryx splendens*, Har., of both sexes, was taken near Walton-on-Thames, Surrey, and *Enallagma cyathigerum*, Charp., male, in the Home Park, Hampton Court, Middlesex (A. Parr); while *Ischnura elegans*, Lind., was captured at Hunstanton in Norfolk (G. T. Lyle).

At the Byfleet Canal, Surrey, dragonflies were numerous on June 16th, those met with being *Libellula depressa*, Linn., a few; *Cordulia ænea*, Linn., many, those seen being chiefly males; *C. splendens*, numerous; *Erythromma naias*, Hans., males plentiful; *P. nymphula*, a fair number; *I. elegans*, a few; *Agrion pulchellum*, Lind., one male taken; *Agrion puella*, Linn., plentiful; *E. cyathigerum*, a fair number; possibly one or two other species were present, including *Brachytron pratense*, Müll. (L. C. E. Balcomb). On June 17th a male *L. depressa* was taken at rest in Prince's Coverts near Oxshott, Surrey (W. J. L.).

K. J. Morton is able to record a new locality for the northern species, *Somatochlora arctica*, Zett. Glen Lochay was its southern limit as far as was known, but on June 17th he took a male in Glen Nant, Argyllshire, and soon afterwards J. W. Bowhill, who was with him, took a female, while one or two other males were seen during passing gleams of sunshine.

For the 'Lancashire and Cheshire Fauna Record' T. A. Coward sent me *P. nymphula*, two males from Nant-y-Merddyn (Denbighshire), taken June 7th and 10th, and a male *E. cyathigerum* taken at Rostherne, Cheshire, on June 22nd. This last had the distinctive black spot on the second segment of the abdomen concave on the anterior margin. The spot varies considerably in shape, but I believe I had not previously seen one of this form. He told me that he had also taken *C. annulatus* at Nant-y-Merddyn in June. H. Bendorf took *E. cyathigerum* on July 22nd at Agecroft, south-east Lancashire, and, at the beginning of August, *Æschna grandis*, Linn., a female, at Ringley, near Manchester. On August 7th he wrote again saying that after the heavy rain on August 6th he went in the evening to a pond a few minutes distant from Prestwich and found six *Æ. grandis* fully out, two half out, and another which was still a nymph but

had climbed on a reed out of the water. He sent me seven males and two females, as well as two nymph-skins which he allowed me to retain. At the same time he forwarded examples of *E. cyathigerum* and *I. elegans* from Middleton near Manchester, Lancs.

In the New Forest a few *Agrion mercuriale*, Charp. (one being a female), were taken at Oberwater on July 28th; but *Ischnura pumilio*, Charp., could not be found, nor did I see anything of it at all during the season. A male *A. mercuriale* was taken at Oberwater as late as August 24th.

At the end of July *C. virgo* was very numerous in the Forest, and on August 7th it was still common, and at Blackwater the males flitting over or near the stream shone very brilliantly blue in the sunshine. On that day two females were noticed on a water-lily leaf, clearly ovipositing, with body arched and its tip closely applied to the surface of the leaf. One soon departed, but from time to time for a quarter of an hour or more the second (presumably the same all the time) was noticed at her task. When she, too, had gone I plucked the leaf, and, holding it to the light, could see what appeared to be large numbers of eggs within the tissue. Some ridges also were visible on the upper surface. The leaf was brought home for further investigation. A few days later I extracted several eggs from it. They were buried between the two skins of the leaf, and although almost transparent and very delicate in appearance, it was not difficult to get them out unharmed. They resembled tiny cylinders with somewhat pointed ends. It would be interesting to know whether the eggs hatched while the leaf was still living or not till it decayed at the end of the summer. After the middle of August this dragonfly rapidly decreased in number.

At Duck-hole Bog in the Forest, on August 9th, a female *Orthetrum cernuum*, Fabr., was seen ovipositing in a watery hole in the bog by striking the surface with the tip of her abdomen. A male followed her, hovering a few inches above her. This confirms my surmise that the nymphs live in such holes in the bogs.

On August 10th a male *C. annulatus* settled on a small upright stick within a yard of me by the side of Blackwater and stayed several minutes while I sat admiring its colours and its emerald eyes, which it occasionally brushed with its legs. On August 24th at another part of the same stream one was seen ovipositing by dropping the eggs just below the surface of the water. I heard her before I saw her, though I suppose it was the sound of the wings that betrayed her rather than the forcible striking of the water.

At Palmer's Water in the Forest a female *L. depressa* was secured as late as August 15th, while L. Balcomb tried without success to catch *Anax imperator*, Leach, at Marlborough Deepes on August 14th, and on Beaulieu Heath the next day.

At Arthog, in Merionethshire, E. B. Nevinson took *C. virgo*

about August 2nd; *Æschna juncea*, Linn., and *Æschna cyanea*, Müll., about August 14th; *Sympetrum striolatum*, Charp., August 1st to 15th, and *I. elegans* (with var. *rufescens*, Leach) August 1st to 15th. He also saw *B. pratense* there on July 27th. About August 10th on Cader Idris, at a height of some 2000 ft., he caught a *C. annulatus* which was ovipositing in a moorland stream. On August 20th he took *L. depressa* in his garden at Cobham, Surrey, and in the same place on August 26th he took *Æschna mixta*, Latr. Afterwards he found the latter species fairly abundant at the Black Pond and at Wisley Pond, both in Surrey.

28, Knight's Park,
Kingston-on-Thames;
March, 1919.

A FEW RECENT RECORDS OF BRITISH ODONATA.

BY HERBERT CAMPION.

A CERTAIN number of the British dragonflies which have come before me since 1913 seem to be worthy of record, for the sake of the locality, if for no other reason. Of these a list is now given, and wherever a record appears without the name of any collector it may be understood that the capture was made by my brother or myself.

CALOPTERYGIDÆ.—*Calopteryx virgo*, Linn., 1 ♀, Llanaelhairn, Carnarvon, 9 : vi : 15, C. Oldham; 1 ♂, Llandwrog, Carnarvon, 9 : viii : 15, per C. Oldham.

LESTIDÆ.—*Lestes sponsa*, Hansem., ♂, ♀, Calthorpe Broad, Norfolk, 9 : vii : 14, H. J. Watts.

AGRIONIDÆ.—*Platycnemis pennipes*, Pallas, 1 ♂, 1 ♀, Cowley, Middlesex, 1 : viii : 16, H. F. Ashby; ♂ ♂, ♀ ♀, Cowley, 19 : viii : 18. *Ischnura elegans*, Lind., ♂, ♀, Calthorpe Broad, 9 : vii : 14, H. J. Watts; Burnham Beeches, Bucks, 24 : viii : 15, 21 : viii : 16, 19 : vii : 17; 1 ♂, 1 ♀, Cowley, 1 : viii : 16, H. F. Ashby; var. *infuscans*, Campion, 1 (thorax with antehumeral stripes present), Burnham Beeches, 23 : viii : 16. *Enallagma cyathigerum*, Charp., ♂, ♀, Calthorpe Broad, 9 : vii : 14, H. J. Watts; 2 ♀, Newborough, Anglesey, 11 : vi : 15, C. Oldham; 1 ♂, Kirkcaldy, Fife, viii : 15, J. Waterston; Burnham Beeches, 23 : viii : 16, 19 : vii : 17. *Agrion pulchellum*, Lind., 1 ♂ (with segment 2 marked as in *A. puella*), Forty Foot Drain, Hunts, 23 : vi : 14; ♂, ♀, Calthorpe Broad, 9 : vii : 14, H. J. Watts. *Agrion puella*, Linn., 2 ♂ (with segment 2 marked as in *A. pulchellum*), 1 ♂ (with the parts of the U-shaped spot on segment 2 disconnected), Bodsey, Hunts, 23 : vi : 14; 1 ♂, 1 ♀, Hailsham, Sussex, 24 : v : 15, H. Bosley; Burnham Beeches, 24 : viii : 15, 21 : viii : 16, 20 : vii : 17. *Erythromma naias*, Hansem., ♂, ♀, Calthorpe Broad, 9 : vii : 14, H. J. Watts. *Pyrrhosoma nymphula*, Sulz., 1 ♀ (teneral), Woking, 19 : iv : 14, G. C. Champion;

δ , Worth Forest, Sussex, 3 : v : 14, N. D. Riley; 1 δ , 1 φ (both nearly adult), Abingdon, Berks, 25 : v : 14, G. C. Champion; δ , Calthorpe Broad, 9 : vii : 14, H. J. Watts; 1 δ , 2 φ , Hailsham, 24 : v : 15, H. Bosley; 1 δ , 1 φ , Burnham Beeches, 23 : vii : 17.

ÆSCHNIDÆ.—*Gomphus vulgatissimus*, Linn., 1 φ , Penymaes, Montgomery, J. Williams Vaughan. *Braechytron hafniense*, Müll., 1 φ , Hailsham, 24 : v : 15, H. Bosley. *Æschna grandis*, Linn., Woking, 18 : vii : 15, G. C. Champion (the specimen flew past the observer's head at the late hour of 8.30 p.m.); Burnham Beeches, 24 : viii : 15, 26 : vii : 17. *Æ. mixta*, Latr., 1 δ , Sewer, near Kingsbridge, S. Devon, 3 : ix : 01, W. D. Lang; 1 φ , Surrey bank of Thames, between Putney and Hammersmith, 15 : x : 18, W. D. Lang. *Æ. cyanea*, Müll., Burnham Beeches, 24 : viii : 15, 22-27 : ix : 17; 1 δ , Ealing, 1915; 1 δ , Ealing, 31 : viii : 16. *Anax imperator*, Leach, 1, Burnham Beeches, 20 : vii : 17 (observed, but not captured).

LIBELLULIDÆ.—*Somatochlora metallica*, Lind., 3, N. E. Hants, Mrs. T. D. Arter, vi : 17 (see also 'Entom.', I, p. 191, 1917). *Cordulia ænea*, Linn., 3 δ , 1 φ , Burnham Beeches, 19-27 : vii : 17 (on the last-named date a pair were also seen in cop.). *Libellula quadrimaculata*, Linn., δ , Hartford, Hunts, 26 : vi : 14, J. Peck; 1 φ , Pant Glas, Carnarvon, 8 : vi : 15, C. Oldham. *L. fulva*, Müll., 1 δ , near Huntingdon, 17 : vi : 14. *L. depressa*, Linn., 1 φ , Hailsham, 24 : v : 15, H. Bosley; 1 φ , Woking, 11 : vi : 15, R. J. Champion; 1 φ , Burnham Beeches, 27 : vii : 17. *Sympetrum striolatum*, Charp., 1 φ , Ealing, 1915; Burnham Beeches, 22 : viii : 16, 27 : ix : 17; 1 φ , Penymaes, Montgomery, J. Williams Vaughan. *S. daneæ*, Sulz., 1 φ , Penmaen Pool, Merioneth, 17 : ix : 15, C. Oldham; 1 δ , Penymaes, Montgomery, J. Williams Vaughan.

58, Ranelagh Road, Ealing,
March 24th, 1919.

NOTES AND OBSERVATIONS.

WICKEN FEN FUND.—This Fund is raised annually by entomologists to assist in defraying the expenses incurred by the Custodian of Wicken Fen, the National Trust, in administering and preserving the Fen, and in providing a watcher to protect the plants and wild life dwelling therein. Contributions are earnestly solicited; they should be sent to the Hon. Treasurer, W. G. Sheldon, Youlgreave, South Croydon.

BRITISH ORTHOPTERA.—We understand that the Ray Society's volume for the present year will be a work on British Orthoptera by Mr. W. J. Lucas. It will treat of earwigs, cockroaches, crickets, and long-horned and short-horned grasshoppers. The illustrations will comprise twenty-five plates (six coloured), a frontispiece, and twenty-five figures in the text.

HYLOICUS PINASTRI IN SUFFOLK.—Last summer, while staying at

Thorpeness, Suffolk, I obtained five specimens of *H. pinastri* in the pine-woods between Aldeburgh and Leiston. There were two males and three females. I secured the first one on July 21st and the last was taken about August 20th. All of them were captured during the daytime resting on the bark of *Pinus pinaster*.—G. M. SPOONER; Slieve Bloom, Yelverton, S. Devon.

ASTHENIA FIMBRIANA.—The drawback to Mr. Thurnall's method of obtaining this species (*antea*, p. 91) is that the type of weather just at the period of emergence does not run in the direction of "bright sunny mornings"—which I presume should also be without a cold wind, or the moth would not fly when disturbed—but towards dull grey skies and chilly weather. *A. fimbriana* can, however, be obtained under these conditions in some numbers. The method I adopt is to tap the oak branches, holding an umbrella or beating-tray underneath; into this the moth usually drops, fluttering a little on arrival, and then sitting quietly and allowing itself to be boxed without difficulty. In my hunting-grounds—oak woods in Surrey and Sussex—from half a dozen to a dozen examples can usually be obtained in a morning. On the 6th inst. I visited the Three Bridges district with the object of obtaining the larvæ of some alder-feeding Tortrices, and after attaining my object I beat the oaks around the well-known tile-yard in Worth Forest. The result in about two hours was nine *A. fimbriana*, two of which, males, were knocked out of one tree.—W. W. SHELDON; April 13th, 1919.

LEPIDOPTERA NOTED IN ST. HELENA AND SIERRA LEONE.—During a passage home from South Africa at this time last year I had two days ashore at St. Helena (March 13th–15th), but the only Lepidoptera seen were *Lampides boeticus* and a small day-moth, *Psara licarsialis*, Walker, both in fair numbers at a few isolated spots inland, half a dozen *Pyrameis cardui*, one *Danais chrysippus*, and one *A. atropos*, the latter in a dark shed in the enclosure around Napoleon's tomb—a singularly appropriate place. During a few days ashore at Sierra Leone (March 23rd–28th), at the end of the dry season, I took within a few miles of Freetown *Byblia vulgaris*, *Precis sesamus*, *P. leodice*, *P. terca*, *P. clelia*, *Neptis agatha*, *N. nemctes*, *N. melicerta*, *Pseudoneptis cænobita*, *Papilio cenea*, *Mylothris asphodelus*, *Teracolus evippe* (variable forms), *Appias bisinuata*, *Ypthima doleta*, *Mycalesis nebulosa*, *D. chrysippus* (all of the white var. *alcippus*), *H. misippus*, *Acræa quirina*, *A. natalica*, *A. egina*, *Citrinophila serena*, Kirby, *Tarucus telicanus*, *Lycænesthes larydas*, Cram., *L. hewitsoni*, Auriv., *Castalius isis*, Drury, *Everes micyclus*, Cram., *Deudorix deritas*, Hew., *Oxylides antifaunus*, Dbl. & Hew., and several day-flying moths, etc. The most conspicuous of the butterflies are the beautiful metallic blue *D. deritas*, flitting in twos and threes with such rapidity as to render capture extremely difficult; *A. egina*, often confining its flight to tree-tops; and the small blue *O. antifaunus*, with its slow flight and singular feathery tails, which immediately attract attention. In the streets of Freetown the only butterflies seen were a few *D. chrysippus*, and in only two or three spots in the vicinity were butterflies at all numerous, the commonest species being the first two on my list. A small patch on the very

summit of Leicester Peak (1954 ft.) yielded the largest numbers, including *H. missipus*, *P. clelia*, *P. cenea*, and *P. demodocus*, which sported indiscriminately with each other in mid-air and sudden rapid flights. About a mile below the summit, while passing through a native village, I had the good fortune to see a white man on a verandah, who turned out to be Mr. Denton, of the C.M.S.; he welcomed me in his house and supplied refreshment, much needed after my whole day's outing in the mountain woods in a tropical sun. I am shortly going out to Malta to reside, and should be glad of reference to any books or papers dealing with the Lepidoptera and other orders of—(1) Malta; (2) Sicily and Southern Italy; (3) Tunis and Tripoli. I believe Malta, from a collector's point of view, is a very poor spot.—H. F. HUNT; 2, Melville Avenue, Pembroke Dock, Wales, March 28th, 1919.

NOTES AND PAPERS ON MEDITERRANEAN LOCALITIES, INCLUDING MALTA, HAVE BEEN PUBLISHED IN THE 'ENTOMOLOGIST' BY PAYMASTER-IN-CHIEF GERVASE MATHEW, R.N., MR. BAINBRIGGE-FLETCHER, R.N., AND OTHERS; ON SICILIAN LEPIDOPTERA BY MISS FOUNTAINE, MR. J. G. BARRETT, AND MR. T. H. LEACH.—(ED.)

REVIEW.

Transactions of the Entomological Society of London. Parts iii, iv, March 29th, 1919.

THE instalment of Proceedings, published with Parts iii, iv of the 'Transactions of the Entomological Society'—delayed, as is the case unfortunately with most scientific publications in these days—contains several notes of particular interest to British Lepidopterists. In the first place I should like to draw attention to Dr. R. C. L. Perkins' observations on breeding experiments with *Pararge egeria*, race *egerides*, Stgr., in Devonshire (pp. lx-lxiv), which appear to solve the mystery of the light and dark forms of the spring emergence. Dr. Perkins' investigations prove that the examples which hibernate in the pupal stage produce the light, and that the early spring-fed larvæ produce the dark, the two forms sometimes overlapping and interbreeding. The occasional very dark examples taken with the *gen. vern.* he attributes to the holding over and hibernation of the normal *gen. ast.* until the following spring. "No definite tendency to dimorphism," he adds, "such as is seen in the spring has been observed in the second generation." Of typical *egeria* I think the emergence may be almost continuous in the south. I have records of its first appearance quite early in February; I have taken it myself quite fresh in the last weeks of October on the Riviera, where also I found a much worn brood flying in the last weeks of March, and Tutt records specimens observed as late as November.

Another note of importance is contributed by Capt. E. Bagwell-Purefoy (pp. clxviii-clxix), who exhibited a series of home-bred *Lycæna arion* with their pupa-cases. From this note we get a further insight into the symbiosis of the larva with the ants *M. scabrinodis* and *M. lœvinodis*, the subterranean pupation and final emergence of the

imago through the ant passages which those under observation never failed to do.

Lastly of less insular concern we have Dr. T. A. Chapman's *précis* of the life-history of that other myrmecophil Lycænid *L. alcon* (pp. clv-clvii), which should be read by all interested in the fascinating subject of ant association, and to whom the papers in M. Oberthür's 'Études,' reviewed in our last number, are inaccessible. H. R.-B.

OBITUARY.

FRANK NORGATE.

IN the first days of March the death was announced, at an advanced age, of Mr. Frank Norgate, a good all-round naturalist chiefly occupied with ornithology. But, though as an entomologist he specialised in Lepidoptera, several of the larger rare beetles fell to his lot—for example, *Ocypus cyaneus*, "identified before he had time to jump off his bicycle, which nearly ran over it." This capture in 1896 is duly noted in the 'Entomologist's Record' (vol. viii, p. 312), and he contributed many other extremely interesting notes on Lepidoptera and Coleoptera alike to the pages of our contemporary and to this magazine. He was, I think, the first to record *bellus*, Gerh., as an English aberration of *Zephyrus quercus* at Drayton Drury in Norfolk ('Entomologist,' vol. vii, p. 69), and this agreeable addition to the then known forms of *quercus* in the British Islands is referred to by Tutt in his 'British Butterflies' (vol. ii, p. 237). His later entomological work as a rule was carried on in the neighbourhood of Bury St. Edmunds in Suffolk, where he lived at Sunny Hill; and in the Norman church of Santon Downham there are many memorials of his family. Earlier observations of Heterocera date from the time when he was living in the house of his father, the Rev. T. Starling Norgate, Rector of Sparham, Norfolk. Mr. Norgate was a man of remarkable personality. It is told of him that once, when accosted for trespassing by an irate keeper, he protested *fortissimo*: "Don't you know who I am? I am one of Her Gracious Majesty's liege subjects"; whereupon the keeper collapsed. Asked to give evidence before the Select Committee on Wild Birds' Protection in 1873, he attributed the killing of nightingales to the keepers' inveterate belief that their music kept the pheasants awake of nights. For these two stories and the details of Mr. Norgate's family I am indebted to his friend, Mr. Claude Morley. Mr. Norgate was twice married—to Miss Golding Bird, the well-known naturalist, whom he first met on an expedition to the New Forest; and secondly to the daughter of the Rev. Henry Inman, Rector of North Scarle, Lincolnshire.

H. R.-B.

SYDNEY WEBB, 1837-1919.

EARLY in the month of April, at Kersney, near Dover, the death took place of Mr. Sydney Webb in his eighty-third year. His name has been familiar to British entomologists of three generations, and

probably there is no finer private collection of native Lepidoptera in the United Kingdom than that made by the deceased gentleman. It includes magnificent series of varieties and aberrations, many of which have been figured and described in contemporary works on the subject, the result of his own indefatigable labours, coupled with those of Bond and Gregson, whose entire cabinets at their death were embodied with his own. Mr. Webb was the younger son of the late Henry Webb, of Redstone Manor, Redhill, Surrey, and very early in life displayed the family passion for collecting. When barely five years old he was taken to Madeira by his parents. One day he was found sitting on the floor surrounded by ferns, which had been left in a vaseulum, trying to sort them into heaps as he had seen his father do. His assistance, however, was hardly appreciated by the grandfather, to whom the specimens belonged. Later he began the study of Lepidoptera, but, unlike most beginners, left the " Macros" to the last, and took the Tineina under his special care, convinced that they afforded the best field for research. His early monographs on this group, although limited to purely British species, were much appreciated on the Continent, and he was elected a life member of the Entomological Society of Vienna. In this connection, too, it is worthy of remark that he was one of the first to insist upon the importance of variation, and to substitute for long rows of identical specimens a few only of the type, leaving the rest for the more interesting divergences therefrom. Mr. Webb never joined the Entomological Society of London, but he was in close touch with the best known working collectors of his day, among others Barrett, Gregson, Sidebotham, Capper, Briggs and Vaughan, his colleagues of the "Basket Club." He was, however, one of the first subscribers to the 'Entomologist,' though his contributions to magazine literature were few, the most important being "Notes on the Varieties of *Peronea cristana* lately in the Collection of the late Mr. J. A. Clark," 'Entomologist,' xlili, pp. 198-201, 265-268; xliv, pp. 289-292, 308-309. But, although entomology was his first love, he had a catholic taste for science and art. Botany, palæo-botany, palæontology, conchology, the study of marine algae, and numismatics—all came within scope of his desire "to know something of everything, and everything of something." His "curiosity," in the classic sense, knew no bounds. It extended to pictures, china, and antique furniture; and in science, as in his hobbies, he was an authority to be trusted. At the end of a long life his interests necessarily shifted from the field to the museum and the sale-rooms, where he was a well-known figure, and where, as elsewhere, he turned to good account the knowledge and discernment achieved in the active pursuit of his subjects. In all these departments he will be missed by his many friends and correspondents. To his son, Mr. Douglas Webb, I am indebted for these particulars of his father's scientific career, and I venture to express the hope that the Webb Collection of Lepidoptera at least may be kept intact, and available for those especially who have given the study of variation their special attention.

H. R.-B.

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THE ANTIQUITY OF THE ICHNEUMONIDÆ.

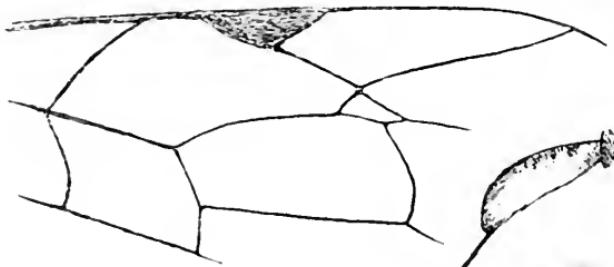
By T. D. A. COCKERELL.

OUR principal source of information on fossil Ichneumonidæ is the important work of Prof. C. T. Brues, "The Parasitic Hymenoptera of the Tertiary of Florissant, Colorado," in 'Bulletin of Museum of Comparative Zoology,' January, 1910. Brues remarks that the only parasitic Hymenoptera yet discovered in pre-tertiary formations is the *Ephialtites* of Meunier, which was described from the Upper Jurassic of Spain. For this fossil Handlirsch proposes a family, "Ephialtidæ," but its characters are very obscure. Viereck remarks that it looks like an Aulacine (Evaniidæ), but there is really little resemblance. Handlirsch notes that Meunier's reconstruction does not agree well with the photograph. The venation cannot be determined at all. Consequently I am rather at a loss to understand why Brues should refer to the "quite typical character of *Ephialtites*," or regard it in any way as satisfactory evidence. It must, I think, be altogether discarded as evidence of the mesozoic origin of the Ichneumonidæ. Brues goes on to note the abundance of Ichneumonidæ and other parasitic Hymenoptera in the Tertiary rocks as far back as the Lower Oligocene. He did not know that certain fossils of the Rocky Mountain region are still older than this, coming from well down in the Eocene. These, which must be at least two million years old, and probably more, are the oldest known Ichneumonidæ. Scudder described five of these Eocene ichneumons, supposing them to be of Oligocene age. One (*Ichneumon petrinus*) is from Chagrin Valley, White River, Colorado; the other four, assigned to *Lithotorus* (new genus), *Rhyssa*, *Glypta* and *Eclytus*, are from Green River, Wyoming. The *Ichneumon petrinus* is evidently an ichneumonid, but on account of its imperfect condition its generic position is quite obscure. The *Lithotorus* is referred by Brues without question to the modern genus *Mesochorus*. Concerning the other three it can at least be said that they are veritable ichneumons, with no visible characters separating them generically from living forms. I have now to add another Eocene

species, quite agreeing with the modern Pimplinæ, and referable to *Pimpla* in the old, broad sense :

Pimpla cocenica, n. sp.

Ferruginous, with black head and terebra, and mesothorax and scutellum fuscous, perhaps black in life. Wings clear, the venation rather dilute fuscous. Head rather small; thorax convex dorsally in profile; abdomen broadly sessile, very obtuse apically. Head and thorax, 3·5 mm.; anterior wing, 6·5 mm.; abdomen, 4·5 mm.; terebra projecting 1·95 mm. beyond abdomen. Measurements of anterior wing in microns : basal nervure, 960; depth of stigma, 400; depth of marginal cell above areolet, 655; depth of areolet 208, its length 512. Green River shales, spring



at head of Little Duck Creek, Cathedral Bluffs, Colorado. (Dean E. Winchester, U.S. Geological Survey.) Among the Florissant species this is nearest to *P. redirivira*, Brues, differing in the coloration and the long areolet. The coloration recalls that of the living *Mesostenus thoracicus*, Cresson. The shape of the areolet suggests *Theronia* and related genera, and it might be permissible to refer the species to *Theronia*. In any event, we have definite proof of the existence of typical Pimplines as far back as the Eocene, and there is so far no proof that any of the Eocene species should be separated from modern genera.

Thus, although we dismiss *Ephialtites* as unsatisfactory evidence, it cannot be doubted that the Ichneumonidæ, so well developed in the early Tertiary, originated at least as early as the later Mesozoic.

THE VARIATION OF *SARROTHIRIPUS REVAYANA*, SCOPOLI.

By W. G. SHELDON, F.Z.S., F.E.S.

(Concluded from p. 106.)

Afzeliana Group.

The principal characteristic of this group is the development of the dark triangular central costal blotch, which in the majority of the forms extends half-way across the superiors,

and in a few of them is developed into a central fascia which entirely crosses them.

ab. *afzeliana*, Swederus.

Synonymy.—*Afzeliana*, Swederus, Kon. Vet. Ack. nya Handl. tome viii, p. 276 (1787); Gmelin, Linn. Syst. Nat. Edn. xiii, p. 2518, No. 1531 (1788); Haworth, Brit. Lep. p. 407 (1811); Curtis, Brit. Ent. p. 29, *afzelianus* (1824); Curtis, Guide, p. 174, *afzelianus* (1829); Stephens, Cat. ii, p. 184, No. 7038, *afzelianus* (1829); Stephens, Haust. iv, p. 147, *afzelianus* (1834); Westwood, Brit. Moths, ii, pl. xci, fig. 15, and p. 152, *afzelianus* (1845); Wilkinson, Brit. Tort. pl. i, fig. 1, *revayana* (1859).

Original description.—“*Phalæna (Tort.) afzeliana*, Swederus, ‘K. Vet. Ack. nya Handl.,’ tome viii, p. 276 (1787).

“*Alis anticis glaucentibus basi maculaque marginali nigrofuscis puncto insuper centrali aberrimo.*

“*Hab. in Anglia : Mus. D. Francillon.*

“*Descn. : Corpus facie Pb. Tort. ilicina, sed paulo minus. Antennæ, palpi, pedesque fusca. Alæ anticæ glaucescentes, subnitidæ. Obsoletissimæ nebulosæ, basi nigrofuscæ macula ad medium marginis exterioris magna subtrigona obsoleta nigrofusca et ad latus posticum hujus maculæ puncto centrali aterrimo notataæ.*

“*Alæ posticæ, argenteo cinereæ.*”

The type-specimen should be in the Francillon Collection in the Hope Museum at Oxford, but the authorities of that institution inform me it is not. Specimens of ab. *afzeliana* are not infrequent in the New Forest, and perhaps in most of the localities in which *S. revayana* is found. Certainly the most typical example of this form I possess came from Perth.

ab. *variegata*, n. ab. (Pl. I, fig. 11.)

Synonymy.—Barrett, Brit. Lep. vi, pl. ccli, fig. 3c (1900); South, Brit. Moths, i, p. 147, fig. 23, No. 6, *afzelianus* (1907).

Description.—This aberration resembles the last except that the ground-colour is testaceous brown instead of grey; the light area of the superiors is also more blotched with dark fuscous.

This form is pretty common in all localities in which I have collected *S. revayana*, or from which I have received it, including the New Forest, South Devon, Isle of Wight, Perth, Tilgate Forest, West Wickham, and Epping Forest.

ab. *adusta*, n. ab. (Pl. I, fig. 12.)

Description.—As ab. *variegata*, but with ground-colour of the superiors, a dark dull-brownish fuscous, and with the costal blotch and markings showing less distinctly owing to the darker ground-colour.

As common as the last, and probably occurring with it in most localities where *S. revayana* is found. My specimens came from the New Forest and Hereford.

ab. *glauvana*, Lampa.

Synonymy.—*Glauvana*, Lampa, Tidskr. vi, p. 31 (1885); *Aurivillius*, Nord. Fjar. p. 80, *glauvanus* (1890); *Staudinger*, Cat. Pal. Lep. i, p. 361 (1901); *Hofmann*, Schmett. Eur. ii, p. 124 (1908).

Original description.—“ab. *glauvana*, Lampa, ‘Tidskr.’ vi, p. 31 (1885); ryggens och framvingarnes grundfärg blåaktigt gråvit, med föga skarpa teckningar; vid kostalkanten en stor, nästan tresidig, mörkgra eller brunaktig fläck; ryggen gråvit, någon gung i midten mörkbrun.”

Translation.—The ground-colour of the lower and front wings is bluish-grey-white, with hardly any definite markings; on the costal margin is a large, nearly triangular dark grey or brown spot: the thorax is grey-white, sometimes dark brown in the centre.

This aberration was described from Swedish examples, and so far as I am aware it has not occurred elsewhere than in Sweden. I have not seen a specimen, but from the description I should judge it to be very similar to ab. *afzeliana*, but without the dark basal blotch, and with ground-colour of the superiors “bluish-grey-white” instead of “greyish.”

ab. *canescens*, n. ab. (Pl. I, fig. 13.)

Synonymy.—Rennie, Conspectus, p. 174 (1832), *degeneranus*; Wood, Ind. Ent. figs. 1040 and 1041, *degeneranus* (1839); Westwood, Brit. Moths, ii, p. 151, pl. xci, fig. 7 (1845), figured and described as *degeneranus* (1845).

Description.—Superiors hoary greyish-white, with dark grey cloudings and blotches, and three waved transverse fuscous lines. The first of these lines represents the outer margin of what is in most of the forms the dark basal blotch, the second and third outline the central area. The base of the superiors, as far as the inner margin of the central dark area, is hoary greyish-white with dark grey blotches. The central area has a large triangular dark-grey blotch on the costa stretching half-way across the wings. Following this is another hoary greyish white transverse band with darker grey blotches; then several dark fuscous indistinct blotches; then another narrow light hoary grey band followed by the dark grey hind margin. Along the base of the ciliae is a row of about seven black dashes. The ciliae and posterior wings, head, palpi, antennæ, thorax and abdomen are dark grey.

ab. *lichenodes*, n. ab. (Pl. I, fig. 14)

Synonymy.—Stephens, Haust. iv, p. 146, *degeneranus* (1834); Barrett, Brit. Lep. vi, pl. celi, fig. 3, *revayana* (1900).

Description.—Similar in all respects to the last, but has a row of prominent dark fuscous spots on each side of the dark central area.

This and the preceding are the forms which have usually been considered by British writers, including Curtis, Stephens and Wood, to be the ab. *degenerana* of Hübner, from which one can only infer that they never saw Hübner's figure, or a true example of what is perhaps the most striking of the *revayana* forms.

ab. *canescens* and *lichenodes* are not uncommon in the New Forest, and I have specimens from the Isle of Wight. Curtis, writing in 1824, speaks of them as being the most abundant *revayana* form at Darenth, and Birchwood, and Stephens in 1834 and Wood in 1839 wrote of them as occurring in these localities. I question, however, if it still occurs near London, all the specimens taken in the Metropolitan area of recent years that I have seen belonging to the more melanic and unicolorous forms.

ab. *fasciata*, n. ab. (Pl. I, fig. 15.)

Description.—This aberration has the hoary greyish-white ground-colour of the superiors which obtains in the last two forms, but the central dark area extends as a fascia across the whole width of the superiors; it also has a similarly coloured basal area to the wings.

ab. *fasciata* does not appear to have been noticed by previous writers.

ab. *depicta*, n. ab. (Pl. I, fig. 16.)

Synonymy.—Curtis, Brit. Ent. 29 (1824) *degeneranus*; Westwood, Brit. Moths, ii, p. 152, and pl. xci, fig. 12, figured and described as *dilutanus* (1845); Barrett, Brit. Lep. vi, pl. ecli, fig. 3 b (1900).

Description.—This aberration bears the same relation to ab. *fasciata* that ab. *lichenodes* bears to ab. *canescens*—that is to say, it has the two transverse rows of prominent dark fuscous spots on each side of the dark central fascia.

I have found these two aberrations in the New Forest; ab. *fasciata* has occurred to me somewhat freely, but of ab. *depicta* I have only four examples.

Undulana Group.

The five forms which I have found in Britain, and which I have grouped under this heading, are all dull-coloured fuscous insects. They comprise the vast bulk of the specimens taken in this country. In the London district especially, and probably in other smoky areas, they represent practically all the examples obtained.

ab. *undulana*, Hübner.

Synonymy.—*Undulana*, Hübner, Tort. pl. ii, fig. 7 (1797); Curtis, Brit. Ent. 29, No. 4, *undulanus*, 1824; Curtis, Guide, p. 174, *undulanus* (1829); Treitské, Schmett. von Eur. viii, p. 22 (1830); Stephens, Haust. iv, p. 146, *undulanus*, 1834; Staudinger, Cat. Lep. Eur. p. 50 (1871); Lampa, Tidskr. vi, p. 31 (1885).

Description.—This aberration is figured by Hübner. There is no description in his book, but I have made one from his figure as follows :

The ground-colour of the front wings is fuscous, with a number of dark fuscous, waved transverse lines. The discal spot is reddish-brown. The thorax is of the same colour as the front wings, the palpi are lighter; the hind wings are light fuscous, shaded on the outer margin with darker fuscous.

A very good character of this aberration is the reddish-brown discal spot. It is not so shown in all of the copies of Hübner's work, which was coloured by hand, but it is in some of them, and as specimens with this spot reddish-brown are common, it is clear that the type of *undulana* should have it.

ab. *albimaculata*, n. ab. (Pl. I, fig. 17.)

Description.—Similar to ab. *undulana*, but the discal spot, which is so important in the diagnosis of that form, and which in it is reddish-brown, is in ab. *albimaculata* light grey. The ground-colour of the superiors, being lighter than in ab. *undulana*, shows up the dark transverse lines and gives this form a more variegated appearance than the other.

I have a long series of this form from the New Forest, where it is common. It or the next have often been described by writers as the type form of *rerayana*.

ab. *plumbea*, n. ab. (Pl. I, fig. 18.)

Description.—ab. *plumbea* has the ground-colour of the superiors a light plumbeous colour, with the usual darker transverse lines faintly indicated.

My series of about a dozen examples was taken in the New Forest, where it is not uncommon. I have not seen it from elsewhere.

ab. *melanosticta*, n. ab. (Pl. I, fig. 19.)

Description.—Similar in all respects to the last, but with a large and prominent central black spot to the superiors.

This is apparently not an abundant form. I have two examples from the New Forest, and have seen others.

ab. *nigricans*, n. ab. (Pl. I, fig. 20.)

Description.—Superiors dark fuscous, with the usual markings

and transverse lines very obscurely indicated, and having the appearance of a dull fuscous, almost black insect.

Common in the New Forest and near London, where the great majority of the examples obtained are of this form.

Degenerana Group.

I have included in this group the very handsome ab. *degenerana* of Hübner, and what I regard as its British equivalent, which I call ab. *rosea*.

ab. *degenerana*, Hüb.

Synonymy.—*Degenerana*, Hübner, Tort. pl. ii, fig. 8 (1797); Haworth, Brit. Lep. p. 406 (1811); Duponchel, Hist. Nat. Lep. ix, p. 47, and pl. ccxxxvii, fig. 6 (1834); Staudinger, Cat. Lep. d'Eur. p. 22 (1861); Sepp, Ned. Ins. 2nd series, i, pl. cccxxxiv, fig. 8, and p. 147 (1862); Staudinger, Cat. Lep. d'Eur. p. 50 (1871); Frey, Lep. Schweiz, p. 72 (1880); Lampa, Tidsk. vi, p. 31 (1885); Aurivillius, Nord. Fjär. p. 80, and fig. 17 (1890); Favre, Mac. Lep. de Valais, p. 78 (1899); Staudinger, Cat. Pal. Lep. p. 361 (1901); Hofmann, Eur. Schmett. ii, p. 124, and taf. lxxii, fig. 19a (1908).

Description.—Named and figured by Hübner, but no description is given. The following is one I have made from his figure :

The ground-colour of the superiors is greyish-white, with dark purple blotches and waved, fuscous transverse lines. The bases are purple, with dark, fuscous, waved outer margins; then follows an area with greyish-white ground-colour, which extends from the dark base to about one-third of the length of the wings; this light area contains two waved, dark, fuscous transverse lines, and some fuscous blotches; next this light area is a dark purple central fascia, extending across the superiors from the costal to the inner margin; this fascia is palest in the centre, and outlined on both margins with dark fuscous; it has in it a transverse, waved white line, and a reddish-brown spot, which presumably is intended to represent the discal spot. Outside this dark central fascia is another greyish-white area, which extends to the hind margin, and which has three waved, fuscous transverse lines, the centre one of which is the broadest and most conspicuous; the ciliæ are light fuscous, with darker longitudinal lines; the head and palpi are white; the eyes and antennæ are dark fuscous; the thorax is white, with dark fuscous blotches; the abdomen is light fuscous, the segments showing darker; the hind wings are light fuscous, with a darker fuscous suffusion on the outer margin.

Ab. *degenerana* varies very much, perhaps more than any other form; each country that produces it seems to have its special type. The only example which I have seen in British

collections, or that, so far as I know exists in them, is a very fine specimen which was taken in the New Forest some years ago by E. Morris, and sold by him to the late Mr. T. Maddison ; it is now in the collection of Mr. P. M. Bright.

There is one noticeable feature in all the ab. *degenerana* hailing from Continental Europe that I have seen, and that is, that they are much larger than any other form of the species, and this peculiarity applies equally to Morris's specimen, which in general characters closely resembles some examples from Germany which are in the National Collection.

ab. *rosea*, n. ab. (Pl. I, fig. 21.)

Synonymy.—Barrett, Brit. Lep. pl. celi, fig. 3 (1900).

Description.—The ground-colour of the superiors is a rosy reddish-brown ; this colour is most prominent in the central transverse fascia ; the usual transverse, thick wavy lines are very prominent, and the insect has a very distinct variegated appearance. The head, thorax, palpi and antennæ are of the same rosy tint as the wings.

Apart from the ground-colour of the superiors ab. *rosea* closely resembles ab. *albimaculata*.

I regard this as the nearest approach the British forms are able to make to the true ab. *degenerana* ; one of my examples, which has a silver-grey ground-colour, I regard as intermediate between the two forms. It is common in the New Forest, but I have not seen it from elsewhere.

The following aberration was described from non-British specimens, and, so far as is known, it has not been found in the British Islands :

ab. *russiana*, Dup.

Synonymy.—*Russiana*, Duponchel, Hist. Nat. Lep. vi, p. 556, and pl. celxv, fig. 3 (1828) ; Staudinger, Cat. Lep. d'Eur. p. 22 (1861), p. 50 (1871) ; Staudinger, Cat. Pal. Lep. i, p. 361 (1901) ; Favre, Mac. Lep. de Valais, p. 78 (1899) ; Hofmann, Eur. Schmett. ii, p. 124 (1908).

Original description.—“Var. *de rerayana*. Les premières ailes sont en-dessus d'un vert d'eau très pâle ou d'un blanc-verdâtre, avec, un grand nombre d'ondulations grises sur toute leur surface, et un raie longitudinale d'un noir brun, qui part de la base et s'étend un peu au delà du milien de l'aile, où elle se divise en deux branches qui s'inclinent vers l'angle anal. A l'extremite de cette raie, est placé un gros point noir, sous lequel on aperçoit une tache réniforme grise.” “*Russie Meridionale*.”

Favre ('Mac. Lep. du Valais,' p. 78) says: “Very rare with the type at Folletteres, near Branson, amongst oak.”

I have made arrangements for the type-specimens of the various aberrations named and figured in this paper, which are my property, to be placed in the National Collection when I have no further use for them.

It is my pleasant duty to acknowledge the valuable assistance which has been afforded me by the Rev. F. D. Morice and Messrs. J. Hartley Durrant and R. South in the preparation of this paper.

Youlgreave, South Croydon ;
April 18th, 1919.

A NEW PAPILIO FORM.

By LOUIS B. PROUT, F.E.S.

Papilio fuscus bowringi, subsp. nov.

♂. 92 mm. (length of a fore wing 44 mm.). Belongs in the *P. f. prexaspes* group. Fore wing as in the corresponding sex of *P. f. prexaspes*, Feld., and *P. f. dayacus*, Rothscl. Hind wing above with the yellowish band reaching abdominal margin, its proximal edge nearly straight, at R^2 almost touching the cell, its distal edge strongly rounded, the costal spot being very small and anteriorly tapering, the second spot anteriorly 3.5 mm., posteriorly 5 mm., the third and fourth 7 mm. long, the fifth 4 mm., the sixth small and nearly round, somewhat suffused with grey scales, the last very small and interrupted; anal spot beyond small and pale, inclining to obsolescence as in *P. f. andamanicus*. Hind wing beneath with the discal band (as usual) whiter, its spots rounder, the longest scarcely 6 mm.; the blue spots beyond ill defined, broken up into inconspicuous dusting; submarginal lunules moderate, not highly coloured, the anterior ones a good deal mixed with white.

Yülinkang, Hainan, June. Type in collection Joicey, kindly presented by C. Talbot Bowring, Esq., of Hoihow, Hainan.

SOME UNDESCRIPTED STEPHANIDÆ IN THE BRITISH MUSEUM.

By E. A. ELLIOTT, F.E.S.

Parastephanelius glaber, sp. n.

♀. Frons arcuate rugose, vertex strongly trans-rugose, occiput becoming gradually smoother towards the slightly raised posterior margin, and with distinct longitudinal impression; temples smooth; carinæ between the posterior ocelli very inconspicuous; anterior frontal tubercle prominent. Scape longer than cheeks, second flagellar joint twice as long as first, third as long as first and second together. Prothorax glabrous, neck rather short; mesonotum smooth, scutellum

with marginal punctures only; pro- and mesopleuræ very finely alutaceous, metapleuræ almost smooth, and median segment with scarcely any visible sculpture. The pleura, abdomen beneath, and the legs with erect white hairs. Petiole slightly longer than rest of abdomen, very finely trans-striate, remainder smooth. The terebra longer than body, black. Hind coxae finely trans-striate, hind femora smooth, tridentate, tibiae compressed to middle. Wings hyaline, stigma brown, nervures darker.

Black; head rufescent, with a white line under the eyes as in *damelicus*; a testaceous mark on frons just below the pale rufescent anterior frontal tubercle. Legs rufescent, base and apex of tibiæ paler and the metatarsi white.

Length 8 mm.; abdomen $4\frac{1}{2}$ mm.; petiole $2\frac{1}{2}$ mm.; terebra 11 mm.

Hab.—Singapore. “F. Sm. Coll.”

The almost entire absence of sculpture is characteristic.

Parastephanelus albiceps, sp. n.

♀. Frons subareuate striate, the striae centrally broken up into granules, vertex and occiput finely granulate striate, temples smooth; second flagellar joint one and a-half times as long as first, third slightly shorter than first and second together. Neck very short, pronotum finely trans-striate throughout, mesonotum subglabrous, scutellum normal, propleuræ finely, obliquely striate, mesopleuræ alutaceous, metapleuræ punctate, separated by a deep crenulated sulcus from the alutaceous and punctate median segment. Petiole trans-striate, shorter than rest of the smooth abdomen; terebra shorter than body, rufescent, apically black. Hind legs with the coxae trans-striate, femora finely alutaceous, bidentate, tibiae compressed to middle. Wings hyaline, stigma and nervures brown.

Black; mandibles basally flavous, all orbits broadly white; antennæ basally, anterior legs and middle legs except coxae rufescent, hind tibiæ and tarsi much paler.

Length $9\frac{1}{2}$ mm.; abdomen $5\frac{1}{2}$ mm.; petiole $2\frac{1}{2}$ mm.; terebra $8\frac{1}{2}$ mm.

Victoria, Australia, R. E. Turner, 1907.

The very broad white orbits are distinctive.

Hemistephanus granulatus, sp. n.

♀. Head excepting the smooth temples granulate rugose, vertex and occiput more finely; posterior margin of head bordered, anterior tubercle very prominent, three very conspicuous carinae between the posterior ocelli. Scape as long as cheeks, second flagellar joint twice as long as first, third nearly as long as first and second together. Pronotum rather short, trans-striate, with smooth posterior margin; mesonotum centrally trans-striate, laterally punctate; scutellum closely punctate throughout, marginal punctures deep; mesopleuræ finely and closely, metapleuræ coarsely punctate, the latter separated by a crenulate sulcus from the median segment, which is confluent punctate, almost granulate. Petiole slightly shorter than rest of abdomen, trans-striate, as is also the base of second segment; remainder smooth, feebly shining. Terebra very nearly as long as

body, rufescent. Hind coxae trans-striate, their femora smooth, bidentate, and tibiae compressed to middle. Wings infumate.

Rufescent; all metatarsi flavous to white.

Length 13 mm.; abdomen $7\frac{1}{2}$ mm.; petiole $3\frac{1}{2}$ mm.; terebra $12\frac{1}{2}$ mm.

Hab.—Swan River, West Australia.

Distinguished by the coarse, granulate sculpture.

If the label "Swan River" is correct, this is the first specimen of this genus known to me from the Australian region, all the others being from South America.

Fœnatopus ocellata, sp. n.

♀. Head arcuate striate, occiput more finely, three strong carinae between the posterior ocelli, posterior margin of head bordered; second flagellar joint one and a half times as long as first, third as long as first and second together. Neck elongate, trans-striate, remainder of pronotum subglabrous, mesonotum coarsely punctate; pro- and mesopleuræ glabrous, metapleuræ and median segment ciliate punctate. Petiole longer than rest of abdomen, trans-striate, remainder smooth; terebra shorter than body, black. Hind coxae trans-striate, hind femora smooth, bidentate, their tibiae compressed to middle. Wings hyaline, stigma yellow-brown.

Black; head and base of antennæ rufescent, ocelli strikingly black; basal third of middle tibiae and basal half of their metatarsi white.

Length 13 mm.; abdomen 8 mm.; petiole $4\frac{1}{2}$ mm.; terebra 10 mm.

Hab.—Mount Matang, Sarawak; January 18th, 1914 (G. E. Bryant).

The shining black ocelli show up strikingly against the pale rufescent vertex; the occiput is partly nigrescent.

16, Belsize Grove, N.W. 3.
31st March, 1919.

RHOPALOCERA OF THE DOULLENS DISTRICT, SOMME,
FRANCE, MAY TO AUGUST, 1918.

By LT. J. A. GRAHAM, R.E.

HAVING read with interest the article on "Rhopalocera of the Upper Lys Valley," by Capt. Mann, in the January 'Entomologist,' the attached list of captures in a certain district near Doullens, about 35 kilometres south-west of Arras, may be of interest.

Most of the captures were made by an officer of a Casualty Clearing Station, whom I met one day going out to collect. He had been collecting in the district since about early June, whereas I only arrived in mid-July and left in early August, thus missing many earlier summer species and later second broods. Also my

time for collecting was limited to a few hours a week in the afternoons.

The list is a combination of my own captures and observations, and my remembrance, coupled with a few notes, of the above-mentioned R.A.M.C. officer's captures.

Adopoda flava, *A. lineola*, *Thymelicus acteon*. Very common in certain fields and along a grassy and flowery sunken road. The proportions of each species were roughly 8 : 2 : 1 respectively. Sometimes three or four *lineola* would be taken consecutively, and then the next fifteen or twenty specimens seen would be *flava*, with two or three *acteon*.

Anugiaades sylvanus. Quite common.

Hesperia malva. Very common in June; much scarcer in August.

Nisoniades tages. Very common in May and June. None seen later.

Chrysophanus phlorus. Not very common, but some good examples taken towards the end of July.

Callophrys rubi. Uncommon; four or five specimens taken only.

Thecla w-album. Quite common in certain spots, and often very low-flying. I took several larvæ full-grown on May 24th, and these duly emerged on June 30th.

Zephyrus quercus. Observed in one locality in a wood, but only a few taken owing to lack of a good long-handled net. *Z. betulae*. One specimen taken in late July.

Celastrina argiolus. A few good specimens taken in a glade.

Cupido minimus. Two or three only, taken at end of July or early August.

Plebeius aegon. Only five or six specimens seen.

Nomiades semiargus. Three specimens taken at the end of July.

Polyommatus icarus. Abundant everywhere.

Aricia medon. Only very few seen or taken.

Papilio machaon. July and August. Fairly common on waste ground where cow-parsley, thistles, etc., grow.

Pieris brassicæ, *P. rapæ*, *P. napi*. Very common, as usual, up to end of August. I took one specimen of the last-named, in good condition, about 35 mm. expanse only.

Euchloë cardamines. Plentiful to about July 7th; disappeared almost instantaneously.

Leptosia sinapis. Not seen, though one or two special localities seemed favourable.

Colias hyale. Fairly common from end of May onwards, chiefly over lucerne fields. *C. edusa*. About twelve specimens taken during end of July. Uncommon.

Gonepteryx rhamni. Very few specimens seen. Chiefly along borders of a wood on waste ground covered with wild flowers, and along the banks of the river Auttie.

Dryas paphia. Two large colonies were found in glades in a wood, and many fine specimens obtained. Var. *valesina* fairly frequent. Some of these latter were of a deep green ground-colour (the same as recorded by Capt. E. H. Mann, probably). The species seemed very much attracted to the flowers of tall thistles, as many as five being seen on one plant at a time.

Argynnis aglaja. Uncommon. A few specimens taken.

Issoria lathonia. One specimen taken, about the end of July or first week in August.

Brenthis euphrosyne. Not common; several specimens taken along a bank at the edge of a wood. *B. selene*. Not common, but more so than *B. euphrosyne*. Same locality.

Melitaea athalia (possibly *dictyna*?). Uncommon. A few taken in May. *M. cinxia*. Quite numerous in May and early June. [By the early date of emergence this observation probably refers to *M. parthenie*.—H. R.-B.]

Araschnia levana. Quite numerous in May along flowery roadside ditches. Var. *prorsa*. A few specimens taken in July (end). I myself found a batch of eight larvæ about three-quarters grown on July 16th feeding on nettle. These duly emerged into fine specimens from August 1st to 4th.

Pyrameis cardui. Abundant from mid-June onwards. No varieties seen. *P. atalanta*. Very uncommon. None seen till about June 20th, and very few seen or taken, even later on up to mid-August.

Vanessa io. Uncommon. Only a few specimens, but fine ones, seen and taken.

Aglais urticae. Abundant as usual.

Eugonia polychloros. Not too common, but about a dozen specimens taken in a week or ten days in a glade. Chiefly settled on bark of beech and ash trees; two taken when settled on the ground.

Polygonia c-album. Fairly numerous, and usually taken in certain definite parts of a wood or glade, as if there were regular "beats" for the species.

Limenitis sibylla. Also fairly numerous. Some specimens very small, others of an abnormal size up to 70 mm. expanse. (One or two may have been *L. populi*?.)

Apatura iris. Moderately common for this species. About ten specimens, chiefly females, taken in one locality in a glade in a wood; others on sallow hedges near the wood. Mostly very worn specimens towards the end of July. One fine ♀ taken at an old "bully-tin" on the ground at Amplier, by chance by another officer.

Pararge aegeria, var. *egerides*. Both broods quite common in one or two spots.

Hipparchia semele. Uncommon. A few taken only, in August.

Epinephele jurtina. Abundant everywhere, almost a pest.
E. tithonus. Uncommon in this district. A few taken.

Aphantopus hyperanthus. Abundant along edges of woods and in clearings. First observed near Auxi-le-Chateau about June 20th.

Crononympha pamphilus. Very common everywhere.

Ercbia aethiops. Two specimens taken in early July.

Melanargia galatea. Extremely abundant, with several minor variations.

Total.—Fifty species taken.

CONTRIBUTIONS TO OUR KNOWLEDGE OF THE BRITISH BRACONIDÆ.

No. 4.—RHOGADIDÆ.

By G. T. LYLE, F.E.S.

DR. NEES VON ESSENBECK included in his genus *Rogas* the *Macrocentridæ* and also the genus *Ademon*, Hal.; these, however, differ from the true *Rhogadidæ* in having the clypeus fitting closely to the mandibles and so doing away with the semicircular oral aperture which is so prominent a feature in all the tribes comprised in the *Cyclostomi* of Wesmael. The *Macrocentridæ* may be readily distinguished from the *Rhogadidæ*, but *Ademon* has certainly a very close resemblance to *Rogas*, and its true position is still a matter of doubt. Wesmael, Reinhard and Marshall considered it to belong to the *Opiidæ*, while Morley follows Haliday and Forster in placing it with the *Rhogadidæ*. Ashmead takes a somewhat different view and includes *Ademon* in his *Rhyssalini*.

The "species genuinae" of Nees have been divided into five genera—*Pelecyystoma*, Wesm., *Heterogamus*, Wesm., *Rogas*, Nees, *Petalodes*, Wesm., and *Clinocentrus*, Hal. Of these the first four fall very naturally together, but the last differs somewhat widely from the others, approaching much nearer to the *Exochecidæ*.

Since the appearance of Bignell's list of Devonshire *Braconidæ* in 1901, scarcely a note on our British *Rhogadidæ* has been published, with the exception of Morley's interesting paper in the 'Entomologist' for 1916 (vol. xlix, p. 83). My knowledge of the tribe is anything but extensive, but few of the species being common, and only very rarely does a correspondent send me a bred specimen—no doubt owing to the inconspicuous nature of the cocoons, or rather the indurated skins of the host larvae containing parasite cocoons, which must frequently be thrown away by the less observant collectors as defunct caterpillars.

Marshall gives the following characters for the tribe ('Trans. Entom. Soc.,' 1885, p. 78) :

Head transverse, occiput margined; mandibles bifid; maxillary palpi 6, labial 4-jointed; abdomen sessile, segments 1-3 largest, sculptured, thyridia of 2nd and 3rd visible; three cubital areolets, the second rectangular (in *Clinocentrus* and *Pelecystoma*, trapezoidal); recurrent nervure rejected; submedian areolet longer than the median; subdiscoidal nervure not interstitial; terebra subexserted (in *Clinocentrus* and *Pelecystoma* exserted).

Genus 1.—*Pelecystoma*, Wesm.*

Distinguished by the internally dilated third joint of the maxillary palpi. A single species has been recorded as British, namely, *P. lutea*, Nees.,† with which I am quite unacquainted; it has been reared from larvæ of *Heterogenea limacodes*, Hufn.

Genus 2.—*Heterogamus*, Wesm.‡

Very close to *Rhogas* and scarcely worthy of distinction. The single species is divided from *Rhogas* principally on account of the white-banded female antennæ and the shorter second cubital cell (abdominal segments 5-7 are retracted, but this is a character now shared by *Rhogas arcticus*, Thoms.).

Dispar, Curtis.§

Has never occurred to me in the New Forest, though Morley took a specimen at Lyndhurst in 1901. In the Cambridge University Museum is a female labelled, "F. J. Crowboro, 9/8/1912." This insect has 42-jointed antennæ; the basal 14 joints of the flagellum are testaceous, then come 6 pure white, while the apical 22 are blackish.

Genus 3.—*Rhogas*, Nees.||

A genus of interesting and rather handsome insects, some being of considerable size. Distinguished by the distinct suturiform articulation, rugulose or aciculated basal segments of the abdomen, and concealed or, at most, subexserted terebra; also the median cell is shorter than the submedian, first discoidal cell longer than the second, and first abscissa of radius shorter than second. They are parasites of lepidopterous larvæ, and, so far as my experience goes, always solitary; it is worthy of note that the few old records of gregarious parasitism have never been confirmed.

* 'Nouv. Mém. Ac. Brux.,' 1838, p. 91.

† 'Mon.,' i, p. 218.

‡ 'Nouv. Mém. Ac. Brux.,' 1838, p. 120.

§ 'B.E.,' dxii.

|| 'Acta Acad. Leop.-Car.,' 1818, p. 306.

In this genus, unlike the majority of the *Braconidae*, the whole of the metamorphoses of the parasite take place within the body of the host. At the time the parasite larva is full grown a sticky liquid, which soon solidifies, exudes from the unfortunate caterpillar and so fixes it firmly to the leaf or twig on which it may be resting; this same liquid is the cause of the hardening of the skin of the host which takes place at about the same time, but only after the entire contents have been devoured. Some species weave a distinct but flimsy cocoon within the indurated skin, but others seem to merely strengthen the walls of their prisons by the addition of a few threads. There can be no doubt that the blown-out appearance of the skin is deliberately caused by the movements of the parasite larva while the skin is still in a flexible condition. Having attained the imago state the parasite bores a hole in the posterior dorsal segments of the host-cocoon and so escapes. The period passed within the cocoon varies from three weeks to nine months or even longer, according to the season and species.

In 'Trans. Entom. Soc.,' 1885, p. 88, the Rev. T. A. Marshall published a table of twelve British species, relying in a great measure on coloration for his distinctions. Little or nothing more was done in this country until in 1916 Morley tabulated the paleearctic species ('Entom.', xlix, p. 85), basing his work on the characters brought forward by Thomson ('Opus Ent.', xvi). This useful table is of great assistance in determining the British species, though the instability of the colouring and nearness of relationship create difficulties in some cases, and I am inclined to think that with the first nineteen species tabulated the length of the hind calcaria when compared with the tibiae has been exaggerated.

I am confident that until the breeding of these interesting insects is taken in hand more thoroughly we shall never be quite sure of the extent and variation of our native species, for it appears to me to be more than likely that the nature of the host may to a certain extent determine the colour, if nothing more, of the parasite. It is also quite possible that at present we have nearly related but quite distinct species confused under one name.

Twenty species have now been recorded as British.

(To be continued.)

NOTES AND OBSERVATIONS.

HIBERNATION OF *AGLAIS URTICÆ*.—In my note on this subject (*antea*, p. 68), and in the corroborative evidence offered by Mr. E. M. Nimmy (p. 89) and the Rev. H. D. Ford (*ibid.*), attention is drawn to the social habit of this species during hibernation. A further point appears to be raised by some further observations made in Devon and Cornwall during the month of April. Will *A. urticae* attempt re-hibernation after the normal spring emergence has been completed? The weather turned bitterly cold throughout Great Britain, and in little less degree in the extreme west, on April 26th. At Penzance, late on the 27th, violent storms of hail burst on the town, accompanied by some snow and rain, and a veritable tornado from the north, which continued for nearly three days. Hibernating *A. urticae* had been very common in the open in all parts of Devon visited prior to this date. I saw none at Penzance or St. Ives, but the bedroom I occupied at Bodmin on the 29–30th was invaded by this butterfly. And when I returned to Exeter next day I was informed that St. Nicholas Priory, the extremely interesting and well-restored relic of the monastic age, was “full of small Tortoise-shells.” I am not aware that butterflies, as a rule, seek shelter from hard weather in houses, sheds, etc., when once on the wing. In my opinion, therefore, it is not improbable that, with the sudden return to arctic conditions, the female *urticae*, with her eggs still unladen, was disposed to resume hibernation against an improvement of external temperature. I may add that indoors I picked up one or two dead examples, but there is, of course, no evidence to prove that they had succumbed to the then existing cold, or had died during normal hibernation, and been overlooked, if ever the room in question where I found them had been “spring-cleaned.”—H. ROWLAND-BROWN.

J. J. LISTER ON HODGKINSON'S RECORD OF *P. ÆGON* IN TUTT'S ‘BRITISH BUTTERFLIES.’—I think we must admit that the conclusions Mr. J. J. Lister arrives at *re* Hodgkinson's record of *P. ægon* on Whitbarrow by Tutt are correct. I have collected with Hodgkinson and found him a most capable entomologist, but I can well believe that in writing out his notes he might deceive Tutt unknowingly, and Tutt, not being conversant with that part of the country, might easily pass it over. Living at Preston, Hodgkinson was within easy reach of Witherslack and district, and he knew every inch of the country. As regards the insect fauna there was no one living at that time who had a tithe of his knowledge, and I am certain that if anyone had asked him if he had ever taken *P. ægon* in Whitbarrow he would have laughed at him and would want to know who he was getting at.—HERBERT MASSEY; Ivy Lea, Burnage, Didsbury.

FORMALDEHYDE FOR “MOULD” ON INSECTS.—A year ago I wrote you if you could suggest a cure for “mould” on specimens of Lepidoptera. Since then it was suggested to me by Dr. Winstan P. A. St John to try 40 per cent. formaldehyde in the form of vapour by soaking a piece of cotton-wool and placing it in an airtight box

containing the infected specimens. This I tried, and other specimens I treated by applying with a small soft brush. In both cases the method has proved entirely successful, and now, after a year, there is no trace of "mould," though some of the specimens had given trouble in this way for twenty-five years and had not yielded to other methods. I think perhaps this information may be useful to readers of the 'Entomologist.'—C. A. SCHUNCK, F.E.S.; Enchene, W. Wallingford, Oxon.

AN EXPERIMENT ON *ANDRENA FULVA*.—On April 23rd I caught six female *Andrena fulva* in Kensington Gardens. I took the six home in a small box, stupefied them with cyanide of potassium, marked them with white paint on the thorax, and let them out the next morning. Four fell into the road, but the other two were each at their nests in about half an hour. The distance was about half a mile; three-quarters of it was between houses.—D. G. SEVASTOPULO; Colvin House, Haileybury College, Herts.—May 8th, 1919.

SPilosoma urticae IN THE ISLE OF WIGHT.—In looking over a book of the records of this island and Hampshire I see that *Spilosoma urticae* has only once been taken; I had the good luck to pick up a caterpillar on the island on August 27th, 1918, which pupated next day and came out on the 8th of this month. It would be interesting to know if there are any recent records of this moth being found in the Isle of Wight.—W. GODFREY; Jessamine Cottage, Shanklin, May 11th, 1919.

ETORIS OCCULTA IN LINCOLNSHIRE.—On arriving home from Belgium and working through back numbers of the 'Entomologist,' I noticed Mr. Thos. H. Court's note (vol. li, p. 259) on this moth. On July 30th, 1914, I took a specimen at sugar at Freshney Bog, Little Coates, about a mile from Grimsby.—F. W. SOWERBY; Cleethorpes, Lincolnshire, May 1st, 1919.

PLUSIA MONETA F. AT HART, CO. DURHAM.—I was delighted to find a few days ago that two plants of *Aconitum napellus*, which I have in my garden here, were very much affected by larvæ which had spun the flower heads together, and upon referring to Barrett and reading the account which he quotes from Mr. F. de Launo of the habits and mode of feeding of *P. moneta* larva, I had no difficulty in coming to the conclusion that they were the young larvæ of that species. Since then some have changed their skins, making a considerable difference in their appearance which has placed the matter beyond doubt. Anyone unacquainted with the young larvæ of *P. moneta* and habit of feeding, coming across them for the first time, might well be excused for thinking they were *Tortrix* larvæ. This is a new and very interesting record for the county, and must, I think, be the most northern yet recorded for England.—J. GARDNER; Laurel Lodge, Hart, May 16th, 1919.

EUPithecia albipunctata VAR. *ANGELICATA* IN SURREY.—From a few larvæ of *E. albipunctata* collected last August in Surrey, I bred on May 5th one fine example of var. *angelicata*, Barrett. According to South's book, "The Moths of the British Isles," this form has

only been recorded from the north.—B. G. ADAMS; 15, Fernshaw Road, S.W.

SPRING EMERGENCES IN SOUTH DEVON.—As the season appears to be late in most parts of the United Kingdom, the following observations may be of interest. I arrived in Exeter on March 31st, and from April 7th to 9th was in East Cornwall. I did not see a single butterfly or moth until April 12th, when I observed several *Aglais urticae* on the Crediton Road, outside Exeter. It was very common at Honiton and on all the railway banks thereabouts on April 18th, and also the following day at Seaton. The examples observed must have gone into winter quarters early. The majority were perfect. April 20th, at Seaton, was the first really warm day of the month. *Pieris brassicae*, all males, was in great force; *P. rapae* rather less distributed. I saw the first at Honiton the day before—exactly a month later than in 1918. Just west of Seaton the coast curves under a towering sandstone (?) cliff, and here the heat was really summerlike. Flying against the warm slope I spotted the first *Euchloë cardamines*, a single male, and this is an early date in any year. It was very small, and evidently just emerged. *Gonepteryx rhamni* was not uncommon in the deep lane leading to the top of the cliff, and *Celastrina argiolus* was flying about the *Euonymus* on the sea front. I should think this county would be a magnificent hunting-ground for Geometers especially. On Easter Monday, April 21st, I paid a visit to Dawlish—to which the same remarks applies, only more so—and enjoyed a delightful walk in the Ashcombe direction. The south-east wind was very cold, though the sun blazed in a cloudless sky, and the cuckoo was calling from hill to hill. I saw no Pierids, but several hibernated *Vanessa io*, and in a little wood just above the town a solitary male *Pararge egeria* var. *egerides* of the light form. I searched in vain for the larvæ of *Callimorpha quadripunctaria* (*hera*) ; most likely it was not yet on the move—or is it a night-feeder? I only wish that I had had the good fortune to be transferred to the west of England at a more entomologically profitable season of the year. Entomologists who anticipate collecting at Dawlish and on the South Devon coast generally in the summer should read Mr. C. M. Mayor's admirable account of the night-flying Heterocera included in his "Retrospect of Five-and-Twenty Years," and published in the February and April numbers of the 'Ent. Mo. Mag.' (Nos. 657, 659).—H. ROWLAND-BROWN; Exeter, April 21st, 1919.

NOTES ON THE LEPIDOPTERA OF MACEDONIA.—The following notes were made whilst serving with the British Salonika Forces from November, 1915, to February, 1919, and were made chiefly on the sector between the Vardar River and Lake Doiran. The list is a very incomplete one, as we were not able to do any night collecting, and could do little whilst on duty in the front line. The dates given in brackets are those of the earliest appearance of the insect on wing in either of the three seasons. *Iphiclides* (*Papilio*) *podalirius* (March 30th) was much commoner than *P. machaon* (April 20th). *Thais polyxena* (April 4th) was only met with in a few places in small numbers flying feebly over marshy ground. *Aporia cratægi*

(April 20th) was very common in May, and the females seem to have the power of assembling the males; we have seen thirty or forty males on a couple of square yards of sand hovering around a female just drying her wings after emergence, and who were so engrossed that several of them were caught in the hand before the remainder took to flight, only to settle again when we had passed a little further up the ravine. The various broods of *Pontia daplidice* (March 12th) swarmed throughout the summer, and it was by far the commonest "white" met with. *Pieris brassicae* (March 20th) and *P. rapæ* (March 12th) were both fairly common, and much more so than *P. napi*, which was decidedly scarce. *Leptosia sinapis* (May 3rd) was fairly common in some of the ravines, but only three or four *Euchloë cardamines* were met with each year. *Colias edusa* was common each season, and specimens were met with at one time or another in every month of the year. The only two *C. hyale* met with were taken in very worn condition in April, 1916. *Pyrameis atlanta*, *Vanessa io* and *Polygona c-album* were met with in small numbers. *P. cardui* was very common each year, and was on the wing from February 29th to late in November. Several *Eugonia polychloros* were met with in March and April, 1918, but *Aglais urticae* was not seen at all, although nettles were by no means uncommon. *Limenitis camilla* appeared from May 12th, and in August and early September was generally to be seen around the ripening fig-trees. *Argynnis maia*, which was very fond of sunning itself on the large flower-heads of *Carduus mariannus* from May 20th onwards, was the commonest and handsomest of the "fritillaries." *Brenthis euphrosyne* and *B. selene* were both met with, but were scarce. *Issoria lathonia* put in an appearance each year about May 20th, and was common along sides of paths and around deserted gardens. *Melitaea cinxia* was met with in several places on open parts of rough hillsides in late May and early June; it was a very difficult insect to net, although it would not fly away from a limited stretch of ground. *Melanargia galatea* (June 2nd) was common and very variable, and did not appear to keep in colonies, haunting a restricted area as at home. *Hipparchia semele* (June 16th), *Pararge egeria* (June 14th), *Epinephele jurtina* (May 26th), *E. tithonus* (July 2nd), *Pararge megæra* (April 1st), and *Coronymphus pamphilus* (April 11th) were all common. A few *Hipparchia briseis* appeared from July 2nd onward, and were very fond of sunning themselves on hot rocks on exposed hillsides. Only a few *Callophrys rubi* were met with each year, and the only *Zephyrus quercus* on June 12th, 1918. *Thecla ilicis* was common in early June about Kermes oak, a low bushy shrub which covers many of the hills. A few *T. acaciae* were taken in early June, 1918. *Chrysophanus phœbas* was met with from March 30th throughout summer, and some interesting varieties were taken. *Polyommatus iolas* was met with for the first time on May 24th of last year; for about a week a few were seen daily around *Colutea arborescens*, the food-plant of the larva; they were very difficult to net, and were rather worn. Several *Lamprides burticus* (June 21st) were met with last year, but *Erres argades* was only met with once in a bog at Saramanli on June 21st, 1916, when four specimens were taken. *Polyommatus icarus* (April 11th), *Aricia medon* (April 13th), *Agriades*

bellargus (May 5th), *Celastrina argiolus* (April 14th) and *Cupido minima* (April 26th) were all more or less common. *Nomiades semiargus*, although not common, was often met with singly. *Hesperia malvae* (April 16th), *Nisoniades tages* (April 1st), *Augiaades sylvanus* (May 14th) and *Adopæa thaumas* (June 16th) were all fairly common. Another "skipper," like a very large *H. malvae*, was met with sparingly in grassy places in early June. A fine *Manduca atropos* was taken at rest on a rock at Kukus on June 9th, 1916; a full-fed larva was brought to us on October 9th, 1917, and a half-fed one found on November 8th of last year at Dedegatch, in Bulgaria. Several larvæ of *Deilephila euphorbiæ* were taken in July, 1917, feeding on *E. cyparissius*; one taken on June 20th last year pupated on July 2nd. *Macroglossa stellatarum* was common nearly all the year round, and was taken on Christmas Day, 1916. Webs of *Malacosoma neustria* larvæ were very common on blackthorn in April. We heard of two *Saturnia pyri* being taken in early May, but did not meet with it ourselves. A few *Arctia villica* (May 14th) were met with each year on herbage on side of trenches, and *Triphæna comes*, *T. orbona* and *T. pronuba* were met with in similar situations about the middle of June. A few *Coscinia striata* were seen flying on dry, heathy hills in early June. Great mullein is a very common plant in the district, and the larvæ of *Cucullia verbasci* were correspondingly numerous. *Plusia gamma* was often kicked up from May 11th until November. We were unable to recognise many of the Geometers, but *Anaitis plagiata* (May 1st), *Zanthonhoë sociatu* (May 16th), *Campogramma bilineata* (May 4th), *Cabera pusaria* (May 14th), *Venilia maculata* (May 17th), *Ematurga atomaria* (April 7th), *Aspilates ochrearia* (May 3rd), and *Chiasmia clathrata* (May 12th) were met with. *Zygæna purpuralis* and *Z. brizæ* put in a yearly appearance early in May. *Z. filipendulae* (May 17th) and *Z. carniolica* (May 16th) were both met with in small numbers each year. Two *Z. epialtes* were taken near Doiran on June 14th last year. Two species of "Forester" were fairly common in May and early June on dry, sunny parts of the hills, but could not be identified with certainty.—F. NORTON and J. E. DELBANTY; 69, Whitchurch Road, Cardiff, April 15th, 1919.

NYSSIA LAPPONARIA IN INVERNESS.—It may be interesting to know that *Nyssia lapponaria* has been this year found in Inverness-shire. My friend Mr. McLachlan sent me, on April 21st, four males which he had found on the heather at Invergarry a few days previously. I understand that hitherto this moth has, in this country, been limited to Perthshire, and is, even there, very local.—R. A. S. REDMAYNE, M.B.; Claremont Lodge, Cobham, Surrey.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—February 27th, 1919.—Mr. Stanley Edwards, F.L.S., President, in the Chair.—Mr. Newman exhibited a series of *Cosymbia pendularia* var. *decoraria* (*subroseata*) bred from ova. They were forced to emerge in January and were all finely developed large specimens.—Mr. Bowman, a black form of *Hibernia leucophæaria*

with conspicuously white fringes, taken in Epping Forest in 1909.—Mr. Turner, a series of *Camptogramma bilineata* var. *testaceolata* from Cyprus, and called attention to the various forms (seven) so far named with the range of possible variation. He also showed a short series of the rare and local *Pentia chloridice* from Cyprus, with its close allies *P. diplidice* (generally distributed) and *P. callidice* (alpine). A large number of lantern-slides were then shown.—Mr. W. J. Lucas, New Forest scenery, species of *Ascalaphus*, and portraits of well-known nature lovers.—Mr. Bennett, details of plant life, points in the life-history of various insects.—Mr. A. E. Tonge, ova of Lepidoptera.—Mr. Dennis, the inflorescence of various grasses and sedges.

March 13th.—Mr. Stanley Edwards, F.L.S., President, in the Chair.—The decease of Mr. A. K. Ing was announced.—Mr. R. Adkin, *Scardia boleti*, generally regarded as rare, taken last June in the New Forest.—Capt. B. S. Curwen, *Coscinia striata* and ab. *melanoptera*, and *C. cibrum* and ab. *candida* from Switzerland; *Utetheisa pulchella* from Gibraltar; *Parasemia plantaginis*, with ab. *matronalis* and ab. *hospita*, and *Oreodemnia quenselii* from Zermatt.—Mr. Sperring, *Pieris napi* with an unusually pale underside of hindwings for a British specimen.—Mr. H. J. Turner, a series of the local *Melanargia pherusa* and its ab. *plesaura* from Palermo, Sicily, with *M. syllius* from Hyères for comparison; also a few butterflies from Palestine sent by Mr. H. W. Andrews, including *Anthocharis helernia*, *Teraclitis fausta*, *Zizera galba*, *Chrysophanus thersamon*, etc.—Mr. Edwards, various species of the genus *Opsiphanes* and its allies from S. America.—A short discussion on the season and on the occurrence of *Cetonia aurata* and *Aromia moschata* in the London suburbs took place.

March 27th.—Mr. Stanley Edwards, F.L.S., President, in the Chair.—Mr. Ashdown exhibited very dark specimens of *Drepana binaria* and *Tanacampa instabilis* just bred from Surrey larvæ.—Mr. Buckstone, *Lycia hirtaria* bred by the late Mr. T. H. Archer, many males of deep black, but slightly relieved by yellow markings.—Mr. H. J. Turner: (1) a long series of *Zygano rhodumanthus* from Hyères with ab. *cingulata*; (2) a series of *Abraeus pantaria*, closely resembling *A. sylvata*, a species formerly held as British.—Mr. H. Main, the myctozoon *Badiamia utricularia* on decaying sticks from Epping Forest.—Mr. Bowman, a melanic *Hibernia defoliaria*, with pure white cilia, from Epping Forest.—Mr. Moore, *Pyrrhocoris aegyptiacus* (Heim.) a *Truralis*, a *Mantis* and other Orthoptera from the Lybian desert.—Mr. Barnett, a bred *Hemaris fuciformis* from Horsley, with very narrow wings and aberrant markings.—Mr. Tatehill, a *Pyrameis atlantica* with a discal blue patch, and a gynandromorph *Polyommatus icarus*.—Lieut. L. A. Box, various hymenoptera and their associates, prey, etc., with notes on their habits, including *Cerceris arenaria*, *Vespula norvegica*, *Crabro capitosus*, *Mellinus arvensis*, *Syntomus praeceps*, etc.—Mr. Edwards, S. American *Nymphidium*, including *Clotida insignis*, etc.—Mr. Tonge, a coal-black female of *Hibernia progonimaria* v. *fusca*.

April 10th.—Mr. Stanley Edwards, F.L.S., President, in the Chair.—Mr. Ashdown exhibited a copy of Panzer's "Symbolæ

Entomologiae " (quarto, 1802), with some fine plates of the Lamellicornia (Col.).—Mr. Leeds, a curiously discoloured example of *Colias edusa* from Herne Bay.—The remaining exhibits were specimens and series of *Acidalia marginipunctata*, by Messrs R. Adkin, Buckstone, Tonge, Ashdown, Mera, Bowman and B. Adkin, in illustration of the paper on this species read by Mr. R. Adkin. In the ensuing discussion the consensus of opinion was that the species was a coast insect, and found, as a rule, only very sparingly inland. Reports of the season were made by several members. Most species were late in appearance, although a few were quite up to their usual date. *Celastrina argiolus* had been seen: *Brephos parthenius* and *Gonepteryx rhamni* had been abundant locally. Vegetation was generally backward.

April 24th.—Mr. Stanley Edwards, F.L.S., President, in the Chair.—Mr. Newman, a living female *Xylomyges conspicillaris* from Worcester, and a *Cassida viridis* (Col.), found on a thistle recently.—Mr. Bennett, a *Papilio demoleus* from S. Africa and a *Catogramma* sp.—Mr. Edwards, *Papilio cenea (merope)* from S. Africa and several forms of the female.—Mr. Buckstone reported that at Horsley he had met with a number of females of *Tephrosia bistortata* with ovipositors extended in crevices of bark in almost dying condition on a morning after an unusually cold night. Remarks were made on the lateness of the season and the general scarcity of larvae this spring so far.—
H. J. TURNER, Hon. Editor of *Proceedings*.

CARLISLE NATURAL HISTORY SOCIETY.—January 23rd, 1919.—Mr. Marriner showed a selection of Coleoptera taken last season in the Skinburness district of the Solway Firth, including a short series of *Cymbiodyta ovalis*, a species new to the Cumberland list.—The Rev. H. D. Ford, a very small, obscurely-coloured *Smerinthus populi* taken locally; also pigmy examples of *Cenonympha pamphilus* and *Bryophila perla*, two specimens of *Eucosmia undulata* hitherto very rare in the county, a striking dark variety of *Hyppa rectilinea*, and two yellowish *Pieris rapae*.—Mr. Day, a series of the new British Hemipteron *Orthotylus virens* taken in numbers on the bay willow, and *Phytocaris pini* beaten in abundance from Scots pine and spruce fir; the bee *Bombus sylvarum*, new to Cumberland, and the beetle *Thalycra sericea*, also new to the county.

March 6th.—Mr. Hope exhibited six examples of *Chrysophanus dispar*, three of each sex, from the Carlisle Museum collection, and a remarkably large and dark *Manduca atropos*, from the Crofton Hall collection, now in the museum.—Mr. Day showed *Nemophila plantaginis* from Portsmouth for comparison with Carlisle specimens, which latter were much larger and darker; also the var. *hospita* bred from Skiddaw larvae; locally taken pigmy examples of *Drepana lacertinaria*, *Spilosoma fuliginosa* and *Arctia caja*, and a specimen of *S. menthastria* var. *walkeri* from Burgh-by-Sands; also various beetles showing extreme colour variation, including *Corymbites aeneus*, *Anomala frischii* and several species of *Donacia*.

April 3rd.—Mr. Marriner showed *Nudaria mundana*, a somewhat scarce moth in the immediate neighbourhood of Carlisle; a series of under-sides of *Pieris napi* of the June broods which varied

considerably in the depth of colour, and a pair of *Spilosoma lubricipeda* var. *zatima* taken *in cop.* in a garden allotment in Carlisle last summer among rhubarb, and believed to be the first recorded occurrence of this form in Cumberland.—Mr. Day, part of his collection of *Geodephaga*, including the genera *Cicindela*, *Carabus*, *Notiophilus*, *Leistus*, etc., and gave an account of the various species which occurred in the mountains of Cumberland.—FRANK H. DAY, F.E.S., *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—March 17th, 1919.—Mr. R. Wilding, President, in the Chair.—Capt. A. W. Boyd, M.C., delivered an address on “Collecting in Egypt.” When opportunity occurred, insects of all orders were collected and sent every few days to Mr. Gilbert Storey, the entomologist attached to the Ministry of Agriculture at Cairo. A very large proportion, some 100 species, about half being Lepidoptera, of Capt. Boyd's captures are apparently undescribed, and we may have to wait some time for the complete list. Some of our rare immigrant species were found quite commonly, and Mr. Boyd related how the men were more alarmed by the squeaking of *A. atropos* than by the proximity of venomous reptiles. Photographs of the various places visited contributed to the interest of the address. Mr. Boyd was heartily congratulated upon the amount of work he had accomplished, often under circumstances of great difficulty.—Mr. W. Mansbridge exhibited a bred series of *Phigalia pedaria*, comprising var. *monacharia* and intermediate forms from Burnley.

April 14th.—The President in the Chair.—Mr. W. Mansbridge read his report as Recorder of Lepidoptera for 1918. Four species of Lepidoptera new to Lancashire and Cheshire had been recorded since the last report, viz. *Liparis monacha* and var. *eremita*, *Bryophila muralis*, *Mixodia palustrana* and *Anacampsis albipalpella*.—Mr. W. Mansbridge exhibited an asymmetrical ab. of *Sesia ichneumoniformis* having the left wing-tip yellow instead of red. He also showed living specimens of *Lithocletis quercifoliella*, *L. viminalis* and *L. sorbi*.—Mr. S. P. Doudney and Mr. W. A. Tyerman brought series of various spring moths taken in the Liverpool district this year.—WM. MANSBRIDGE, *Hon. Sec.*

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"THE HETEROPTERA OF INDO-CHINA."

BY W. L. DISTANT.

Fam. REDUVIIDÆ.

Subfam. ECTRICHODIINÆ.

THE species of this subfamily received from M. R. Vitalis de Salvaza contain a large and unsuspected number of undescribed forms, and we may still expect other novelties.

LIST OF SPECIES ALREADY RECEIVED.

<i>Antiopula consimilis</i> , sp. n.	<i>Neozirta orientalis</i> , gen. and sp. n.
* <i>Hæmatolæcha bicoloripes</i> , sp. n.	<i>Castra dolosa</i> , sp. n.
" <i>apicimaculata</i> , sp. n.	<i>Ectrychotes crudelis</i> , Fabr. " <i>andreeæ</i> , Thunb.
" <i>picturata</i> , sp. n.	" <i>comottoi</i> , Léth.
" <i>obscurata</i> , sp. n.	" <i>tonkinensis</i> , sp. n.
" <i>chapana</i> , sp. n.	<i>Vilius rubroniger</i> , sp. n.
" <i>nigrorubra</i> , sp. n.	" <i>conifacies</i> , sp. n.

Antiopula consimilis, sp. n.

Sanguineous; antennæ, hemelytra and transverse segmental fasciæ to abdomen beneath, black; antennæ finely, longly hirsute, first and second joints more robust, second longest, third longer than fourth, fifth and sixth shortest; pronotum with a central discal longitudinal impression traversing the whole of the anterior and about half of the posterior lobe, the latter with its lateral margins distinctly globosely elevated and inwardly acutely lineately defined; scutellum transverse, the lateral apical angles widely separated; anterior and intermediate femora moderately thickened.

Long, 9 mm.

Habitat.—Laos, Vientiane.

Allied to *A. pumila*, Stål, but differing by the much narrower longitudinal discal impression to the pronotum, the concolorous sanguineous connecivum, etc.

* A species described by Breddin "*Hematolæcha morosa*" from Tonkin was not obtained.

Hæmatolurcha bicoloripes, sp. n.

Sanguineous; eyes, transverse pronotal impression and posterior area of longitudinal impression, scutellum, clavus, excluding base, an oblong spot on outer margin of clavus but not reaching its base, apical angle of eorium, membrane, broad spots to connexivum, sternum, broad lateral suffusions to abdomen beneath, bases and narrow apices of femora, the tibiae and suffusions to tarsi black; first and second joints of antennæ black, remainder miltilated, second joint longer than first; longitudinal impression to pronotum moderately narrow, not extending beyond basal half of posterior lobe, the transverse impression strongly punctate, and a submarginal depressed series of punctures to the posterior lobe which are concolorous; anterior and intermediate femora somewhat strongly incrassated.

Long, 11 mm.

Habitat.—Tonkin; Hoabinh.

Allied to *H. jokiensis*, Dist.

Hæmatolurcha apicimaculata, sp. n.

Head, pronotum, scutellum, sternum and legs reddish-ochraceous; apex of head, eyes, two large central longitudinal spots and marginal spots to posterior pronotal lobe, hemelytra, apices of anterior and intermediate femora, narrow bases and broad apical areas to anterior and intermediate tibiae, the posterior legs, metasternum, and abdomen beneath, excluding basal and lateral areas, black; antennæ longly hirsute, the basal joint ochraceous, remaining joints black, first and second joints longest and subequal in length; central longitudinal impression to pronotum broad and strongly excavated and together with the sublateral impressions to posterior lobe irregularly punctate; connexivum above black, more or less inwardly ochraceous; scutellum transverse, the apical lateral angles widely separated.

Long, 11 mm.

Habitat.—Tonkin; Laos, Vientiane.

Hæmatolurcha picturata, sp. n.

Dull dark-ochraceous; antennæ, interior basal and more extensive apical areas of hemelytra, quadrate spots to connexivum, sternum, excluding lateral margins, transverse fasciae to abdomen beneath, basal areas of intermediate and posterior femora, black; antennæ longly hirsute, black or dark castaneous, first joint moderately but distinctly shorter than second; central longitudinal impression to pronotum moderately slender, slightly broader on anterior lobe, the sublateral incisures to the posterior lobe more acute, all of them, however, more or less obscurely punctate; scutellum transverse, the apical angles widely separated.

Long, 11 $\frac{1}{2}$ to 13 mm.

Habitat.—Annam, Keng Trap; Tonkin, Than Moi; Indo-China, Muong Sin.

Hæmatolæcha obscurata, sp. n.

Pale brownish-ochraceous: anterior pronotal lobe, apical area of hemelytra, and the sternum darker in hue; antennæ longly hirsute, first joint ochraceous, remaining joints fuscous, second joint distinctly longer than first; longitudinal incisure to pronotum slender and acute, it and the sublateral incisures to the posterior lobe somewhat obscurely punctate; scutellum transverse, the apical angles widely separated; anterior femora with a single prominent spine beneath. A species also to be recognised by its somewhat flattened structure.

Long, 12 mm.

Habitat.—Tonkin; Chapa.

Hæmatolæcha chapana, sp. n.

Closely allied to the preceding species, but darker and more piceous in hue; antennæ entirely piceous, basal joint not paler but concolorous; anterior femora with two prominent spines beneath.

Long, 12 mm.

Habitat.—Tonkin; Chapa.

Hæmatolæcha nigrorubra, sp. n.

Head, antennæ, legs, rostrum, body beneath, scutellum, and membrane of the hemelytra, black; connexivum, anterior lobe of the pronotum, the clavus and claval margin dull pale olivaceous; posterior pronotal lobe and the corium testaceous; antennæ longly hirsute, second joint subequal in length to first; pronotal incisures narrow; scutellum transverse, the apical angles widely separated.

Long, 14 mm.

Habitat.—Suang Prabang; Pak Tha, Ban Thiou.

Neozirta, gen. nov.

Antennæ four-jointed; head subequal in length to first joint of antennæ, behind eyes constricted, between and before eyes laterally and centrally longitudinally ridged; collar short; rostrum with the first and second joints subequal in length; pronotum about as long as broad at base, with the anterior lobe much narrower than the posterior lobe, strongly longitudinally excavated, the central excavation extending through the anterior lobe, the other two excavations confined to the lateral areas of the posterior lobe; scutellum broad, a little broader at base than long, or including the apical angles about as broad as long; other characters generally as in *Zirta*.

Allied to the neotropical genus *Zirta*, Stål, but differing by the narrower and shorter anterior lobe of the pronotum; the pronotum nearly or about as long as broad at base, not distinctly shorter as in *Zirta*; scutellum shorter and relatively broader.

Neozirta orientalis, sp. n.

Head, pronotum, scutellum, connexivum, rostrum and body beneath reddish-ochraceous or pale sanguineous; antennæ

hemelytra and lateral areas of sternum, black; basal lateral margins of corium reddish-ochraceous or pale sanguineous; legs piceous, femora usually suffused with dull ochraceous; antennæ with the second joint longest, first and third joints subequal in length; longitudinal incisures to pronotum coarsely punctate; other structural characters as in generic diagnosis.

Long, 17 mm.

Habitat.—Tonkin; Chapa.

Castra dolosa, sp. n.

Piceous-brown; head, antenna, rostrum, sternum and legs brownish-ochraceous; abdomen beneath black, base of apical segment ochraceous; head before eyes nearly twice as long as post-ocular portion; antennæ with the first and second joints stoutest, and about subequal in length, apical joints paler in hue, first joint about reaching apex of head; pronotum with a well-pronounced tubercle on each side of anterior margin, profoundly, broadly, centrally, longitudinally sulcate, posterior lobe about twice as long as anterior lobe the lateral angles prominently nodulose, and excepting these the whole surface transversely rugose, the anterior lobe more or less longitudinally striate; scutellum broad, the produced posterior angles curved; femora beneath shortly spinous; second joint of rostrum very long, a little longer than first and third joints together.

Long, 18 mm.

Habitat.—Haut Mekong, Muong Sing.

Etrychotes tonkiniensis, sp. n.

Head reddish-ochraceous, eyes black; antennæ black, base of first joint ochraceous; pronotum ochraceous, anterior lobe a little paler in hue than posterior lobe, the transverse and central longitudinal incisures and the basal angles of the anterior lobe, black; scutellum black, the posterior spinous angles ochraceous; hemelytra black, the anterior and posterior angles and the costal margin of the corium ochraceous; connexivum reddish-ochraceous, with quadrate black spots; body beneath reddish-ochraceous, lateral areas of sternum and somewhat broad transverse fasciae to the abdominal segments, black; legs ochraceous, basal areas of the femora, apices of tibiae and tarsi piceous; antenna longly hirsute, second joint longest; pronotum with the transverse and central longitudinal incisures punctate; scutellum transverse, the posterior angular spines curved; a distinct incisure before each lateral margin of the posterior pronotal lobe.

Long, 13 mm.

Habitat.—Tonkin.

Vilius rubroniger, sp. n.

Head, pronotum, scutellum, and body beneath, pale dull testaceous, the anterior pronotal lobe and ante-ocular area of head a little darker in hue; antenna, eyes, connexivum, hemelytra, rostrum, legs, and apical area of abdomen beneath, black or blackish; lateral marginal area to corium pale dull testaceous; first and second joints

of antennæ subequal in length: pronotal longitudinal incisures somewhat narrow; femora not spined beneath.

Long, 21 mm.

Habitat.—Haut Mekong; Vien Poukha.

Allied to *V. melanopterus*, Stål.

Vilius conifacies, sp. n.

Head, pronotum, scutellum, connexivum, rostrum, body beneath and legs, reddish-ochraceous; antennæ (excluding basal joint), eyes, hemelytra, metasternum, abdominal segmental spots, viz. two at base, and one each on fourth, fifth and sixth segments, black: apices of femora, tibiæ and tarsi, piceous or black; basal joint of antennæ and an elongate, angulated, lateral, marginal spot to corium pale ochraceous; antennæ with the second joint longest; anterior femora finely sparingly spined beneath: pronotal incisures punctate.

Long, 14 mm.

Habitat.—Laos, Vientiane.

Allied to *V. nigritrinitatis*, Dist., but differing by the colour of the basal joint of the antennæ, the unspotted connexivum, the dark apices to the femora, etc.

CONTRIBUTIONS TO OUR KNOWLEDGE OF THE
BRITISH BRACONIDÆ.

No. 4.—RHOGADIDÆ.

By G. T. LYLE, F.E.S.

(Continued from p. 136.)

Grandis, Giraud.

I am very pleased to add this fine species to our British list: it has hitherto been recorded from Austria, Hungary and Italy only. At once recognised by the hind tibiæ, which are black, with the basal sixth whitish. I have two males reared from New Forest larvæ of *Amphipyra pyramidea*, March 14th, 1912, and April 4th, 1913; both had remained within their cocoons for the previous nine months or so.

In "Species des Hyménoptères, etc.,"* the length of the insect is given as 7–10 mm. and the expanse as 12–16 mm.: my specimens measure 7 mm. in length and expand 14 mm. I may mention, however, that other cocoons, no doubt of this species, from which I have failed to rear the parasites are considerably larger than those from which my specimens emerged.

In constructing its cocoon the parasite larva does not utilise the whole of the skin of the host but only the five central

* Vol. i of 'Braconidæ,' p. 276.

segments, the two anal segments and also the six following the head shrivelling up.

The segments containing the cocoon are somewhat distended, so that the indurated skin takes the form of a crescent. This construction is very firmly attached to a twig with the natural glue I have already mentioned. Unlike some of the species which weave nothing worthy of the name of cocoon within the hardened skin of the host, *grandis* constructs a distinct, though flimsy, pure white silken lining which is easily detached. In the New Forest this is certainly not an uncommon parasite of *Amphipyrta pyramidea*; the host larva is killed when rather more than half grown, and my experience would seem to point to the later caterpillars only being attacked, though, of course, it is possible that parasitised larvae feed up less rapidly than their more fortunate fellows.

Cruentus, Nees.*

A large, robust species with rufous thorax, the second discoidal cell only half as long as the first, and antennæ shorter than the body.

The only British specimen hitherto recorded was taken by Morley on the Norfolk Broads in August, 1911. A very fine female captured by Harwood near Colchester some few years ago and now in his collection has 57-jointed antennæ, and measures 9 mm. in length with an expanse of 15½ mm. The species is said to have been bred on the continent from *Dianthæcia cucubali*.

Rugulosus, Nees.†

Another fine species not hitherto recorded as British. It has the second cubital areolet subquadrate, and the third abdominal segment strongly punctate at the base and longitudinally striate towards the apex. In 1914 Col. C. G. Nurse sent me four reared by him between June 20th and 23rd of that year from Wicken larvae of *Arsilonche albopicta*. They were accompanied by their cocoons, by which it could be seen that the host larvae had attained to something approaching half growth before succumbing. Only the central segments of the caterpillars had been made use of in constructing the cocoons, which greatly resemble in shape those of *R. grandis*. On the continent it is recorded as having been reared from *Aeronycta euphorbiæ* and *A. abscondita*.

Prator, Rein.‡

Probably the largest species we have and quite easy to identify. Bright testaceous, with only the antennæ (except

* 'Mon. Aff.,' i, p. 212.

† 'Berl. Mag.,' v, p. 32, N. 49, and 'Mon. Aff.,' i, p. 209.

‡ 'Berl. Ent. Zeit.,' 1863, p. 260.

extreme base of scape), eyes, stematicum, claws, hind tibiæ at apex, hind tarsi and a small spot above each radix, black. Radius of hind wing distinct, hind calcaria rather weak, approximately one third as long as the metatarsus. Antennæ with about 70 joints.

Reinhard described the species from a single female and the male appears to be still unknown.

The only British specimen hitherto recorded is a female bred by Morley from a small larva *Smerinthus populi* at Monks Soham, Suffolk. In my collection is a fine example of the same sex which measures 10 mm. in length and has an expansion of no less than 20 mm.; this specimen I owe to the generosity of B. S. Harwood, who captured it on a lighted shop window at Sudbury. The species is very possibly nocturnal, as are many other testaceous Hymenoptera. Harwood has still another female taken at Colchester some years ago.

Irregularis, Wesm.*

A smaller species having a length of 6–7 mm. only. It is at once recognised by the smooth and shining apex of the abdomen as well as by the flavous, black-tipped hind tibiæ. In the Cambridge University Museum are two ancient examples from the collection of the old Cambridge Philosophical Society; these are unfortunately damaged, one having lost its head and the other parts of both antennæ—the usual fate of pinned specimens. Harwood has a female taken many years ago at Colchester by his father, and no doubt that mentioned by Marshall ('Trans. Entom. Soc.', 1885, p. 91). Morley gives numerous British localities.

Bicolor, Spin.†

Variable; very close to *tristis*, Wesm., the distinctions given by Marshall being somewhat obscure and principally differences of colour only. I have several times taken it in the New Forest, the earliest date being May 16th and the latest July 20th, and captured a male at Beeton Bunny, Hants, on May 16th, 1910. All these have 41–44-jointed antennæ, which caused me for some time to doubt the correctness of my determination. Marshall gives the number of joints as 37–40.

Geniculator, Nees.‡

At first sight very similar to *gasterator*, Jurine, and *irregularis*, Wesm., but distinguished from those species by the short and feeble hind calcaria. My only example, a female, was bred on

* 'Nouv. Mém. Ac. Brux.', 1838, p. 101.

† 'Ins. Lig.', ii, p. 128.

‡ 'Mag. Ges. Berl.', 1811, p. 33.

September 1st, 1910, from a small larva of *Arctia villica* at Beer, Devon, in which county Bignell also reared several from *Odonestis potatoria*. On the continent it has been obtained from larvae of *Arctia caja* and *Porthesia similis*. With so many common hosts it is strange that the species should be so rare with us. My specimen has the antennæ 47-jointed. Marshall gives the number as 48-52.

Modestus, Rein. *

Added to the British list by Marshall, who describes ("Brac. Europe, etc.", vol. i, p. 294) how the species was reared in 1886 from cells of the solitary wasp, *Eumenes coaretata*, taken near Bournemouth, and concludes, no doubt correctly, that the parasites had preyed upon the caterpillars with which the wasps had stocked their cells. I have often found the store of *E. coaretata* to consist entirely of larvae of heath-feeding species of the genus *Eupethcia*; it is therefore very possible that one or another of these was the host. In Marshall's collection in the British Museum there is only a single specimen without data; this insect, perhaps, scarcely agrees with Reinhard's description in one or two minor details, principally in the colour of the abdomen, which is decidedly more rufous. I have several insects, males and females, no doubt of the same species as Marshall's specimen: they were bred from larvae of *Eupethcia nanata*, in late May and early June, 1915, given to me by Mr. G. B. Oliver. I have no note of the locality from which they came. All these examples have the second and third abdominal segments and the apex of the first dull rufous.

Nigricornis, Wesm.†

Easily mistaken for a dark form of *circumscriptus*, though differing therefrom in the shape of the first abdominal segment, which in *nigricornis* is much narrower at the base, and also in having longer antennæ. Apparently scarce; the only specimen I have is a female bred by Tonge from a nettle-feeding larva at Reigate, June 17th, 1911. In this example the antennæ are fuscous only at the apices.

Testaceus, Spin.‡

According to Reinhard, who was copied by Marshall, this is a species with 33-35-jointed antennæ and the second abdominal segment in the female "considerably broader than long." I have several insects which agree in every way with the original description of Spinola and also agree with Reinhard's and

* "Berl. Ent. Zeit.", 1863.

† "Nouv. Mem. Ac. Brux.", 1838, p. 105.

‡ "Ins. Lig.", ii, p. 131.

Marshall's descriptions, excepting that the second abdominal segment in the female is quadrate, and the first in the male is rather longer than its apical breadth.

Three females bred in the New Forest in August from small swallow-feeding geometer larvæ, probably *Cabera exanthemata*, and also two males and three females reared from *Cilix spinula* (Cambridge), have antennæ 33-36-jointed. I am not inclined to think these are a form of *circumspectus* and must echo Bridgman, who took a female in 1889 near Norwich, and, as mentioned by Morley, writes of it: "I believe it to be *testaceus*—I think it must be *testaceus*." Harwood has an insect in his collection bearing a label "*Rhogas testaceus*" in Bridgman's writing, and it is possible that this may be the identical specimen of which Bridgman writes; but, however that may be, it is certainly of the same species as the insects bred by me and mentioned above. Reinhard tells us that *testaceus* has been reared as a gregarious parasite from large larvæ of *Cerura vinula* and *C. bijida*, and it is also recorded as bred on the continent as a solitary parasite from such hosts as *Cilix spinula* and *Eupithecia sobrinata*; this rather points to confusion, and I imagine that should the gregarious broad-bodied parasite of the puss moths ever be rediscovered it may be necessary to separate it from the *testaceus* of Spinola and Nees.

Cantherius, sp. nov.

Male.—Black, with only occasionally a faint suggestion of a paler spot on the disc of the second abdominal segment.

Female.—Black, with the first abdominal segment marked with a flavo-testaceous chevron, the point of which rests on the centre of the apex of the segment; second segment with a large central flavo-testaceous spot on the disc, also, occasionally, a small pale basal spot on the third segment, and the apex of that and the two following segments more or less testaceous.

Both sexes have the vertex, frons, face and orbits rufofuscous (sometimes almost black), with the clypeus, mandibles and palpi testaceous. Belly fuscous (rather lighter in the female), prosternum, mesosternum and mesopleuræ rufofuscous, the last distinctly longitudinally paler where adjoining the mesosternum. Legs testaceous with the hind coxæ alone fuscous, hind tibiæ apically and all the tarsi darker. Antennæ dark, with scape, and flagellum basally beneath, testaceous, about as long as the body, 40-42-jointed. Mesopleuræ slightly granulated, rugose under wings, metathorax and abdomen pubescent. Mesothorax, scutellum and metathorax granulated, the last with a distinct central longitudinal carina.

Abdomen of male elongate, of female somewhat shorter; first segment half as long again as its apical breadth, second slightly longer than broad in the male, quadrate in the female, third broader than long; first, second and base of third rugulose. The remainder smooth, first and second carinated. Terebra very slightly exserted.

Wings hyaline; stigma fuscous with the inner angle pale: nervures fuscous; radius after the first abscissa and central abscissa of cubitus decolorous; second cubital areolet somewhat narrowed externally, not longer than second discoidal; second abscissa of radius one-third or one-fourth longer than first transverse cubital nervure. Radius of hind wing obsolete. Hind calcaria feeble, less than one-third as long as the metatarsus.

Length, $4\frac{1}{2}$ -5 mm.; expands $8\frac{1}{2}$ -9 mm.

Described from three males and four females. It will be noticed that this description is very similar to that of *modestus*, Rein.—indeed for some time I considered my specimens should be referred to that species, but after breeding a considerable number I am convinced they are distinct: *Modestus* has the pale portions of the body rufotestaceous, not flavotestaceous, the stigma testaceous, not fuscous, the mesopleurae smooth and shining and the antennae longer; it is also of larger size. All the females I have seen have the chevrons on the first abdominal segment very well marked and most noticeable, though in a genus where the extent of the pale marking on the abdomen varies so much, it is more than likely that examples will be found in which this prominent distinguishing mark is almost, if not quite, absent.

In the New Forest this is a fairly abundant parasite of *Semiothisa liturata* and I have bred it at various dates between March 18th and May 11th, all the insects having passed a winter within the hardened skins of their hosts, which are firmly attached to a pine needle. All the host larvae were beaten from Douglas fir simultaneously with numbers of the larvae of *Thera variata* (*obfuscata*), but from none of the latter have I ever obtained the *Rhagis*. It is difficult to find a reason for this, the larvae of the two moths being so similar in size, habits and appearance.

Harwood obtained a female by beating firs at Beirchurh Park, Essex, June 25th, 1914.

Circumscriptus, Nees.*

Undoubtedly our commonest species; a frequent parasite of young larvae of *Noctua*. Distinguished by the number of joints of the antennae being less than in any other British species, excepting *testaceus*; in my many typical specimens they number from 37-41. Reinhard describes seven colour varieties, of which the first (body and legs testaceous excepting the metathorax and first abdominal segment, *Aleondes nigriceps*, Wesm.) appears to be the most plentiful. Very considerable variation is also noticeable in size, the usual length being $4\frac{1}{2}$ -5 mm. and expanse 8-9 mm., though I have a fine female measuring 6 mm. in length and expanding fully 11 mm.

In the New Forest I have reared the species from larvae of

* Mon. Aff., i, p. 216.

† Nouv. Mém. Ac. Brux., 1838, p. 109.

Triphaena fimbria, April 29th, 1909, *T. pronuba*, December 1st, 1913, *Calymnia trapezina*, June 22nd, 1911, *Tæniocampa stabilis*, June 30th and July 12th, 1915, *Noctua xanthographa*, April, 1911, and also from undetermined larvæ of *Noctuæ* on apple July 7th, 1911, on broom April 23rd, 1914, and on *Harpalium rigidum*, July 30th, 1914. Beaten from oak September 17th, 1916, and October 10th, 1916. Swept at Bectou Bunny, Hants, May 16th, 1910, Hunstanton Sand Hills, Norfolk, June 5th, 1918, and Cambridge, August 1st, 1918. No doubt the insect is common throughout the country. Marshall and Morley give numerous localities.

Armatus, Wesm.*

Somewhat similar to the last, but having larger eyes and the vertex behind them with straight sides. Often entirely testaceous with the exception of the eyes, stemmaticum, claws, terebra and a small dot over each radix which are black. The male is very like that of *Petalodes unicolor*, though, of course, easily separated therefrom by the suturiform articulation.

I have one male and two females bred from New Forest larvæ of *Ephyra linearia*, September 30th, 1912, April 28th, 1915, and June 6th, 1916; the two last passed a winter within the hardened skins of their hosts. Male antennæ 42-jointed, of both females 39-jointed.

(To be continued.)

NOTES ON ODONATA COLLECTED IN NORTH WALES
IN JUNE AND JULY, 1918.

By A. H. NEWTON, M.B., C.H.B.

ON June 4th I found several small pools near the summit of Conway Mt. literally swarming with *Libellula quadrimaculata*, Linn. These pools were small and shallow with grassy bottoms, and with no reeds or herbage other than the short mountain grass at the edge of the water. The insects were difficult to catch—not because they appeared to avoid one, but because of their sober colouring and the quickness of their flight. They seemed to live their lives at high tension. After a time I found that by listening for the flutter of wings as they came together *in copula* I could frequently follow and catch a pair of them.

Very little time is spent *per collum*. It seemed to me, however, that there was something unusual about the attitude when in this position, and after watching carefully I came to the conclusion that the male passes his claspers below the mouth of the female and grips her neck from the ventral aspect. It even seemed that at the first moment of contact the female was

* 'Nouv. Mém. Ac. Brux.', 1838, p. 112.

gripped in the ordinary dorsal position, and that by a jerk of the abdomen the male then obtained the unusual hold above described. This ventral grip would, I think, bring the second abdominal segment of the male rather nearer to the ninth female segment in these comparatively short-bodied dragonflies and thus be some slight advantage.

L. quadrimaculata rests very little near the water. It takes flights which may almost be described as swoops of from 50 to 100 yards inland and there rests among the short grass and heather. Oviposition takes place by the female beating the water with the tip of her abdomen, the male rendering no assistance in this work.

I saw a male emerge from the nymph-case. The only means of exit from the water was by climbing up slender stalks of grass which did not project more than 3 or 4 in. above the surface. It seems possible that a certain number may be drowned under these circumstances, as the grass stems are not always long enough or strong enough to keep them entirely out of the water during this stage of helplessness.

Certainly I felt that the insect I was watching would be so drowned, and I therefore removed it to safety on the bank.

The next two or three weeks were dull with very cold, high wind, and the pool was not visited. It was visited again on July 1st, but although the day was fine and hot not a dragonfly was to be seen. Had the cold killed them off or had they migrated elsewhere? It is curious how susceptible to cold are these apparently well-protected insects. I have never seen a record of one having been found in a state of hibernation.*

The dorsal integument of *L. quadrimaculata* is curiously translucent. In an attempt to preserve the coloration I eviscerated several and filled the body-cavity with magnesium carbonate. The result was not satisfactory, however, as the white powder showed markedly through the translucent skin.

It seemed to me that the nymph-cases of these insects were curiously short compared with the body of the imago. On comparing them with *Escoa grandis*, Linn., I find that whereas in the latter species nymph-case is to body of imago as 64 to 100, in the *L. quadrimaculata* the proportion is as 53 to 100.

Of the Agrionide *Erallagma cyathigerum*, Charp., *Ischnura elegans*, Lind., and *Pyrrhosoma nymphula*, Sulz., were all common at the same pools. The female of *E. cyathigerum* is very variable in body-colouring, tawny, French grey and greenish-blue all being found. One male of this species was found in which there was a faint continuation forward of all the dark markings of the abdomen, making them similar to the dagger-shaped markings of the female.

At pools some miles higher up the river *Agrion puella*; Linn.,

* *Sympycna fusca*, Lind., habitually hibernates on the continent.—W. J. L.]

was very common. These insects were more abundant on the banks of a lane adjacent to the pool than at the margin of the water. I found no other Agrionidae in North Wales.

Of *Libellula depressa*, Linn., one fine male was caught on the golf-links near the sea-shore, two or three miles from any pool which looked a likely breeding-place.

From July 5th to the 12th I was at Llanbedr, Merioneth. Here in the ditches which intersected, the Morphæ *Cordulegaster assulatus*, Latr., and *Orthetrum cærulescens*, Fabr., were common. Of the former I caught several males, but no female; whether I saw one or not I do not know. Both sexes of *O. cærulescens* were common, but all were rather damaged. On a very narrow reed-bordered mountain stream both sexes of *Culopteryx virgo*, Linn., were common. *C. annulatus* was also found in the same situation.

In a small glade in one of the woods, half a mile from water, a newly-emerged *C. virgo* was found. The wings lacked the blue pigmentation except for a beautifully metallic costa. In this same small glade were found *L. depressa*, ♂ and ♀, *O. cærulescens*, ♂ and ♀, and *C. annulatus*, ♂. This female *L. depressa* was the only one I have ever seen, and unfortunately I could not catch it. I have caught the male in four different parts of the country, but in each case it has been a solitary specimen, no other being seen in the neighbourhood.

With the exception of *Calopteryx splendens*, Harr., and *Platycnemis pennipes*, Pall., taken later on the Severn, this completed my collecting for the year. The smallness of the record was due in great measure to the unfavourable weather conditions prevailing during the time at my disposal.

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Coventry.

NEW AND LITTLE KNOWN BRITISH APHIDES.

V.

By FRED. V. THEOBALD, M.A., F.E.S., ETC.

Myzus gei, nov. sp.

Alate viviparous female.—Green; antennæ much longer than body to about the same length, the two basal segments green, remainder brown. Eyes large and black. Cornicles green, long, thin, cylindrical, dusky just at apex. Cauda pale green. Legs long and thin; green, except at apices of tibiae and the tarsi, which are dark. Proboscis green, dark at the tip. Basal antennal segment larger than second; third longer than fourth, with 12–14 sensoria, more or less in a line and not quite reaching the end of the segment; fourth a little longer than fifth, which has the usual subapical

sensorium: sixth darkest, about as long as fourth and fifth; basal area not half as long as fifth. Proboscis reaches past second coxae, apical segment acuminate, longer and narrower than penultimate. Cornicles about as long as fourth antennal segment, faintly imbricated with a few transverse striae near apex. Cauda wider than cornicles, a little more than half their length, with four long hairs on one side, three the other and a subapical one; expanded at base. Anal plate green. Wings much longer than body, with pale greenish-brown stigma and pale-brown veins; hind wings with one or two oblique veins.

Length, 1·5 mm.

Food Plant.—Wild avens (*Geum urbanum*).

Locality.—West Wood, nr. Hythe, Kent (4, vi, 15).

Alate females found under the leaves, each surrounded with small green larvæ, the latter with antennæ of five segments; third to fifth darkened apically. The venation of the wings is very marked and the hind wings in one specimen have one oblique vein one side, two the other. I fancy this was the insect I found in the New Forest in August, 1915, but I unfortunately lost the specimens.

Myzus mercurialis, nov. sp.

Apterous viviparous female.—Pale to bright green; antennæ darkened except at base. Cornicles dusky at apices. Apices of tibiæ and the tarsi dark. Eyes red. Antennæ a little longer than the body; basal segment much larger than second; third longer than fourth, with a single sensorium near base and with the second hair on one side capitate: fourth segment a little longer than fifth; sixth not quite so long as fourth and fifth, its basal area not half as long as fifth. Cornicles thin and cylindrical, very little thicker than third antennal segment and about as long; two striae at apex. Cauda greenish-yellow, about half the length of the cornicles, spinose at edges, flattened sculpturing on surface; three hairs each side and one subapical. Proboscis green, dark at apex, rather broad, and just reaching the third coxae.

Length, 1·5 to 2·2 mm.

Food Plant.—Dog's mercury (*Mercurialis officinalis*).

Localities.—Ventnor, Isle of Wight (10, v, 11); Wye (24, iv, 16).

An obscure green species found in abundance in both localities in the spring. The cauda with its flattened dorsal sculpturing is marked.

Myzus galiiifolium, nov. sp.

Alate viviparous female.—Generally resembling *Aphis galii*, Kaltenbach, in colour, but with long cornicles. Antennæ dark, except base of third segment. Cornicles and cauda black. Tibiæ pale except at apex and to some extent the base of cornicles. Antennæ nearly as long as body, basal segment much larger than second; third longer than fourth, but not so long as sixth, with 11–14 sensoria

along its whole length; fourth as long as fifth; sixth as long as or a little longer than fourth and fifth, basal area nearly one-half length of fifth; flagellum four times as long as basal area; third to sixth imbricated. Cornicles slightly longer and much broader than fourth antennal segment, cylindrical, slightly expanding basally (in some they are the same length as the fourth segment), markedly imbricated. Cauda about half length of cornicles, acuminate, broad at base, spinose, with four hairs each side. Anal plate black and spinose, with hairs. Wings normal; second cubital cell with the stem as long as the cell to not quite so long.

Length, 1·9–2 mm.

Apterous viviparous female.—Similar to *A. galii* in colour, but cornicles very much longer. Antennæ shorter than body. Cornicles black, longer than third antennal segment. Cauda black, one-fourth to less the length of cornicles. Basal segment of antennæ larger than second; third longer than fourth, but not so long as sixth; fourth longer than fifth; sixth about as long as fourth and fifth, its basal area half as long as fifth, and not quite as long as one-quarter the length of flagellum; fifth and sixth black. Cornicles thicker than antennæ, but thinner than cauda, densely imbricated and laterally serrated. Cauda broad at base, narrowed to apex, which is blunt, with three hairs on each side, finely spinose. Eyes black, rather small. Legs moderately long and thick; brownish-yellow; tarsi dark and to some extent the apex of tibiæ and femora.

Length, 1·5–1·7 mm.

Food Plant.—Bedstraw (*Galium cruciatum*).

Localities.—Stouting, nr. Hythe (23, v, 13); Wye (1–10, vi, 13); Yarmouth, Isle of Wight (1, vii, 15).

Described from a series collected by Captain Alban Duffield, M.C., and myself at Stouting and Wye. It bears a general resemblance to Kaltenbach's *Aphis galii*, but can be separated at once by the long cornicles. It lives in dense clusters on the top shoots of the Bedstraw, both on the stems and under and on the leaves and also in the flower heads. I have never noticed any distortion caused by it. The colour varies roughly from almost black to deep dusky or clayey brown. From the shiny black *Aphis aparines*, Kaltenbach, the *Aphis molluginis*, Koch, it may also be told by its long cornicles, especially of the apteræ in which they diverge, and not markedly converging as in that species, which feeds on *Gallium mollugo*. Del Guercio describes an aphid on *Galium erectum* from Portugal, the apterous female being dark green and pear-shaped and the alate female with four sensoria on the terminal third of the third antennal segment, and another, *Aphis phlomoidea*, which is green like *A. erecta*, but with ringed antennæ in the alate female and with three rows of sensoria on the third segment, and the cornicles in the apterous female barely longer than the cauda. The species described here can clearly be none of these.

Aphis abrotaniella, nov. sp.

Alate viviparous female.—Head and thorax dark. Abdomen pale green with a dark patch caudad, varying from one-half to one-third the length of the abdomen and with four large black lateral spots cephalad of the cornicles. Antennæ as long or longer than the body, dark; basal segment wider but no longer than second; third as long as or even longer than sixth, with 35-40 large sensoria, giving a very marked tuberculate appearance; fourth about three-fourths the length of the third, with one to four sensoria; fifth more than half length of fourth, with normal subapical sensorium; sixth with basal half a little more than half the length of fifth and rather less than half the length of flagellum; fourth to sixth imbricated. Cornicles short, dusky olive-green to brown, about as long as basal area of the sixth and very much wider, gradually narrowed apically (in a few even in the same specimen the cornicles are more cylindrical); apex flared, faintly imbricated. Cauda short, as long as or shorter than the cornicles, wider and blunt; faintly spinose, with six lateral hairs, dusky. Anal plate dusky. Legs rather short, dark, except tibiae, which are almost green except at apex. Wings large, veins very thin. Proboscis reaching to base of third coxae, acuminate.

Length.—1·5-1·8 mm.

Food Plant.—Southernwood (*Artemisia abrotani*).

Locality.—Great Lalkeld, Penrith, Cumberland (23, i and 3, iii, 13) (Britten).

A series of alate females sent me by Mr. Britten taken as early as January on the Southernwood. I had placed them provisionally as *Aphis tanacetina*, Walker, but a closer examination shows the antennæ to be very distinct, being (1) longer than body, (2) third segment with more sensoria and tuberculate in appearance, and (3) more marked still the fourth, with only 1-4 sensoria and the fifth very much longer than in *tanacetina*, and (4) the cornicles broader and not contracted at the base.

Macrosiphum solanifolii, Ashmead.

This Aphid was described by Ashmead from potatoes in America ("On the Aphididae of Florida," "Canad. Ent.", vol. xiv, p. 92, 1882). The most recent account is given by Miss Edith Patch ("Bull. 242, Maine Agri. Exp. Station," October, 1915). On going over my collection I find this species unnamed, and in two cases labelled *Macrosiphum solani*, Kaltenbach. This latter is quite distinct and is a *Myzus*. We have thus two green apterous species on the potato of roughly similar appearance, but they can easily be separated when mounted by the *Macrosiphum* having the apices of the cornicles reticulate (also in the alatae), whilst in *solanum* they are not, and the porrected frontal lobes are marked. I have found or received *solanifolii* frequently in Kent and Devon and have had it sent from Essex and Hertfordshire. It lives on rose in autumn, where it oviposits, and in June and

July alatae appear and fly to the potatoes, returning to roses in the autumn to produce sexuales.

Myzus solani, Kaltenbach.

Myzus solani, Kaltenbach, is much more abundant on potatoes and frequently swarms and does damage. I have records of this from Ross-shire, N.B. (Miss D. Jackson), down to South Devon. So far it has only been found on potatoes. The apterous female only was described by Kaltenbach, so I append a description of the alate viviparous female, as follows:—

Green; thorax darkened; antennæ about as long as the body, third segment, apical half of fourth and fifth and all the sixth dark. Apices of tibiae and all the tarsi dark, also tips of cornicles and proboscis. Eyes dark red and black. Third antennal segment with 23–27 sensoria, some small, most large, on one side, extending to near apex; fourth segment a little longer than fifth; sixth about equal to four and five. Hairs on head and antennæ simple. Proboscis reaching to second coxae. Cornicles pale green, cylindrical, shorter than third antennal segment, one or two striae across apex, rest imbricated. Cauda pale yellowish-green, finely spinose, with three pale hairs on each side. Wings normal: insertions yellow, stigma yellowish-brown; veins yellowish-green.

Length.—2·5 mm.

Three other Aphides occur on potatoes in this country, namely *Rhopalosiphum dianthi*, Schrank, which is frequently very common, *R. tuberosellæ*, Theobald, possibly only a variety of the former, and an aphid with short antennæ which I take to be *Aphis solanina* of Passerini.

The olive-brown *Aphis silybi* of Passerini I have found only once in Cornwall.

Chermes cooleyi var. *coweni*, Gillette.

Some débris of a Chermes sent me by Dr. A. Henry taken on the Douglas Fir in Surrey, the New Forest, and Ireland appear to be this species recorded on the Red Fir (*Pseudotsuga mucronata*) and Blue Spruce (*Picea parryana*) from Colorado by Gillette, who describes the species *cooleyi* and the variety, *vire* 'Proceedings of the Academy of Natural Sciences of Philadelphia,' January, 1907, pp. 3–10 and 10–14 (Pls. i–vii). It is hoped that anyone finding a Chermes on this conifer will send fresh specimens so that it can be definitely identified.

A NEW MYMARID FROM JAVA.

BY ALAN P. DODD.

Gonatocerus lucidus, n. s.

♀. Thorax and legs rich orange-yellow; head pale yellow; eyes and ocelli black; abdomen dusky; antennal scape yellow at base, dusky at apex, the flagellum dusky-black.

Head normal; eyes large, bare; ocelli close together; frons de-

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pressed, margined dorsally and laterally. Antennæ inserted wide apart against eye margins and rather above middle of face; 11-jointed, scape, pedicel, eight funicle joints, and a solid club; scape long and slender, as long as next three joints combined; pedicel about one-third longer than its greatest width; funicle 1 somewhat longer than pedicel, 2 almost twice as long as 1, 2-4 subequal, 5-8 gradually shortening, 8 not one-half as long as 2; club very long, slender, as long as preceding four joints united. Thorax slender; pronotum short, transverse; scutum distinctly wider than long; parapsidal furrows complete; scutellum longer than wide, with a delicate cross-furrow near apex; scutum and scutellum finely granulate. Fore wings long, broad, broadly rounded; subhyaline; discal cilia dense, in about thirty rows, almost obliterated beneath venation; longest marginal cilia equal to one-seventh greatest wing width; marginal vein long. Hind wings very narrow, about half as wide as length of their longest marginal cilia. Abdomen short, ovate; ovipositor valves not exserted. Legs slender; posterior tibiae rather longer than their tarsi; tarsi 5-jointed. Length, 1·25 mm.

d. Vertex of head, scutum, and scutellum dusky. Antennæ 13-jointed; scape short, thickened, not much longer than wide; pedicel wider than long; funicle 1 much swollen, one-half longer than its greatest width, 2 and 3 hardly thickened, each somewhat longer than 1, the others gradually shortening, the apical joint no longer than the preceding.

Described from two females, three males, labelled "5000-7000 feet, Tjibodas, Java, Aug., 1913, Dr. Konigsberger."

Type and co-types in the British Museum.

TWO NEW STEPHANIDÆ.

BY E. A. ELLIOTT, F.E.S.

Diastephanus bilineatus, sp. n.

♀. Head finely trans-striate, temples smooth, two carinae between the posterior ocelli; all frontal tubercles distinct; posterior margin of head bordered. Scape fully as long as cheeks; second flagellar joint one and a-half times as long as first, third longer than second, but shorter than first and second together. Neck of pronotum elongate, finely trans-striate, remainder smooth; mesonotum subglabrous, very diffusely punctate; pro- and mesopleuræ very finely trans-striate, metapleura and median segment cribrate punctate, not separated. Petiole trans-striate, as long as rest of abdomen, which is smooth and shining. Terebra shorter than body, rufescent, with a subapical flavous ring $\frac{3}{4}$ mm. broad before the black apex. Hind coxae and femora distinctly, their tibiae less strongly trans-striate, the femora tridentate and tibiae compressed to middle. Wings hyaline, iridescent, stigma and nervures brown.

Black; head rufescent, mandibles except extreme apex, frons centrally broadly and the orbits up to the level of the anterior tubercle pale flavous, point of abdomen below terebra white. Anterior legs pale rufescent, hind legs darker, with knees and metatarsipale.

- Length 8-8½ mm.; abdomen 5 mm.; petiole 2½ mm.; terebra 7 mm.
Hab.—Pusa, Bihar (G. R. Dutt), May 12th, 1909; Chapra, Bengal (Mackensie).

The whole of the lower part of the head is white flavous, excepting two more or less narrow rufescent lines separating the frons from the inner orbits. The sculpture of the head, the colour of the terebra and that of the femoral teeth will serve to distinguish this species from all yet known with tridentate femora.

Parastephanelus scitus, sp. n.

♂. Frons strongly areuate striate, vertex and occiput trans-striate, temples smooth, posterior tubercles subobsolete, two carinae between the posterior ocelli, posterior margin of head bordered. Scape longer than cheeks, second flagellar joint one and a-half times as long as first, third rather longer than second. Pronotum trans-striate, the extreme base smooth, neck short; mesonotum finely punctate, scutulum normal; propleurae obliquely striate, mesopleurae smooth, metapleurae coarsely punctate and separated by a sulcus from the finely and closely punctate median segment. Petiole finely trans-striate, as long as rest of abdomen, which is smooth and shining. Hind coxae coarsely, their femora finely trans-striate, the latter somewhat strongly inflated, bidentate, tibiae compressed to a little beyond middle, wings hyaline, slightly iridescent, stigma rufescent, basally pale, nervures blackish.

Black; head dark red, antennae pale rufescent, becoming gradually darker towards the apex, extreme base of pronotum, front legs, middle tibiae and tarsi, hind tarsi and base of second segment rufescent. There is a scarcely noticeable paler line under the eyes.

Length 8 mm.; abdomen 5 mm.; petiole 2½ mm.

Hab.—Pusa, Bengal (T. B. F.), June 21st, 1911.

This is the first specimen of this subgenus I have seen from India proper, all others being from more southern localities, one from Ceylon, one from Ding-Ding Island in the Indian Ocean, and several from Borneo and Australia. It differs from all other males yet described in the sculpture of the head and in the colour.

NOTES AND OBSERVATIONS.

EUCHLOË BELEMIA AND ZEGRIS EUPHEME IN MESOPOTAMIA.—Major H. D. Peile, I.M.S., F.E.S., has sent me two gum transfers of the above butterflies for identification. He writes (March 12th and 24th): “*E. belemia* has been fairly common at Basra for the past six weeks, and is fast on the wing. The sexes are similar in colouring, the markings and ground-colour white.” Of *Z. eupheme* he says: “Until yesterday I only secured two females and no males, it being very rare down on the level ground. But yesterday I walked to some low hills about two miles away and found their haunt, and have now a good series. It is a pretty, dainty species, fast on the wing, and is

common in the flowery hollow, and the ground being very stony chasing examples is difficult as one cannot turn quickly. Occasionally the female has no orange, but it usually has some. Just as Seitz says, *Melitaea didyma persica* frequents 'the crests of stony hills.' They are usually put up settled on the rough ground at the highest part of the stony ridge. This morning (March 24th) I got a very fine female, settled with wings spread, on the ground in the sunshine just outside our mess tent, though I have had to ride or walk out some three miles to get any, and it is a great speculation as to whether one gets a few or none. Yesterday I got three *Papilio machaon* males at rest on the summit of the stony ridge, but all were damaged. I also got a very dark male of the 'Doll' butterfly, and a ? *Hytha* sp., or grayling-like species with tawny patches and two minute spots on the underside of the fore wings. This is abundant in Persia in the summer, and may be common here then. A few days ago (March 12th) we saw two hibernated *Pyrameis atlanta*, and *P. cordui* is about in thousands."—F. A. OLDAKER; The Red House, Haslemere.

NOTES ON SOME LEPIDOPTERA OF THE PAS-DE-CALAIS AND OF THE SOMME.—The following notes, although rather late, may be of some interest to other collectors who have visited the districts referred to. RHOPALOCERA.—*Papilio machaon*: Abundant near Beauquesne, Vignacourt, in 1915, and Albert in 1917. The larva and imago were also seen fairly frequently near Hesdin in 1918. *Pieris brassicae*, *P. rapae*, and *P. napi*: Generally common. *P. napi* swarmed along the low-lying meadows beside the Ancre between Albert and Aveling in 1917. Some dwarf examples of this species were seen near Beauval in 1918. *Euchloë cardamines*: Not very abundant. A few seen near Avesnes-le-Comte in 1917, and near Beauval and Hesdin in 1918. *Colias hyale*: Fairly common in most districts. *Gonepteryx rhamni*: Generally abundant. *Apatura iris*: A half-dozen or so larvae taken near Beauval in 1918. The imago was not seen. *Limenitis sibylla*: Rather common near Hesdin in 1918. *Polygona c-album*: One very worn specimen taken at Hesdin in 1918. *Eugontia polychloros*: The larvae and pupæ of this species were to be found commonly at Cavyron St. Martin and La Loge. The imago was seen frequently in the Forêt d'Hesdin in 1918. *Aglais urticae*: Usually common everywhere. *Vanessa io*: Abundant everywhere. *Pyrameis cordui*: Abundant at Hesdin in 1918. *Pyrameis atlanta*: Not very abundant. A few were seen at Albert in 1917, and near Beauval and Hesdin in 1918. *Araschnia levana*: About half-a-dozen seen near Beauval in 1918. *Ab. prorsa*: One seen at St. Gratien in 1915. It was flying very commonly at Albert in 1917. *Dryas paphia*: Generally common. In 1918 this species, along with the var. *valesina*, was very abundant at Hesdin. On many days it was possible to count as many *valesina* as *paphia* flying over the bramble flowers in this district. *Argynnis aglaia*: About a dozen examples captured at Hesdin in 1918. *Melitaea cinxia*: The larva and imago were found sparingly near Beauval and near Hesdin in 1918. *Melanargia galatea*: Fairly abundant. *Pararge egeria*: Abundant near Beauval and Hesdin in 1918. *Pararge megaeira*: Very

abundant everywhere. *Epinephele jurtina*: Not so abundant as the other "Browns." *Aphantopus hyperanthus*: Some seen near St. Pol in 1916. *Cœnonymphia pamphilus*: Abundant everywhere. *Cœnonymphia arcania*: Abundant near Hesdin in 1918. *Callophrys rubi*: Occasionally seen near Beauval and Hesdin in 1918, and near Flixecourt in 1919. *Chrysophanus phœas*: Common in most districts. *Lycæna astrarche*: Individuals seen at Hesdin in 1918. *Polyommatus icarus*: Generally common. *Hesperia malvæ*: Family common near Beauval and Hesdin in 1918. *Augiades sylvanus*: Common everywhere. **HETEROCERA.**—*Smerinthus ocellatus*: One taken at Beauval, 1918. *Mimas tiliæ*: One taken at Noyelle Vion, 1917. *Macroglossa stellatarum*: Seen rarely at Albert, 1917, and near Hesdin, 1918. *Hemaris fuciformis*: The larvae of this species were abundant near Hesdin in 1918. *Trochilium apiformis*: Freshly emerged specimens taken on poplars bordering the Ternoise, near Gauchin (St. Pol), in 1916. *T. crabroniformis*: One captured at Hesdin in 1918. *Hylophila prasinana*: Seen on the beeches in the Bois de Robermont, near Avesnes-le-Comte, in 1916. *Miltochrista miniata*: One taken at Hesdin, 1918. *Enistes quadra*: A freshly emerged female taken at Hesdin, 1918. *Parasemia plantaginis*: Fairly common near Beauval, and occasionally seen at Hesdin in 1918. *Callimorpha hera*: One taken at St. Gratien in 1915. *Arctia villica*: A few seen at Hesdin in 1918. *Spilosoma mendica*: A half-dozen examples captured at Noyelle Vion, 1917. *Phragmatobia fuliginosa*: Fairly abundant at light at Albert in 1917. *Dasychira pudibunda*: The ova, larvae and imagines were very abundant at Hesdin in 1918. *Arctornis v-nigra*: A rather worn ♀ of this species, believed to have been taken near Hesdin in 1918. *Porthetria monacha*: Very abundant on the beeches at Hesdin in 1918. *Trichiura cratægi*: The larva of this species was abundant in the woods between Beauval and Gezaincourt in 1918. *Aglia tau*: After some very heavy rain and hail-storms the larva of this handsome insect was abundant near Hesdin in 1918. Those I found never reached the pupa stage, owing, no doubt, to injuries that they had received. At Flixecourt in 1919 severed wings were seen lying on the paths in the woods. About the middle of May a freshly emerged ♀ was found at the base of a young beech tree. While imprisoned in a box she laid about a dozen large brown oval ova. *Saturnia carpini*: A number of larvae found in the overgrown gardens at Albert in 1917. *Macrothylacia rubi*: The larva were very abundant near Beauquesne in 1915 and the imago also abundant at Beauval in 1918. *Stauropus fagi*: A full grown larva and a freshly emerged ♂ taken at Hesdin in 1918. *Pheosia dictæoides*: One example captured at rest on some poplars by the flooded areas near Albert in 1917. *Drepana falcataria*: Occasionally seen at rest at Flixecourt in 1919. *Drepana cultraria*: Once taken at Hesdin in 1918. *Heliaca tenebrata*: Common near Avesnes-le-Comte in 1916, Beauval and Hesdin in 1918. *Euclidia glyphica*: Abundant at Beauval and Hesdin in 1918. *Catocala nupta*: One seen at Montigny in 1915. It was fairly abundant along the Bécourt road at Albert in 1917. *Brephos parthenias*: Very abundant in the woods at Flixecourt in 1919. It seemed very fond of settling on the muddy patches on the paths. *Ennomos autumnaria*: Once met with near Villers L'Hôpital in 1918.

Ennomos quercinaria: Abundant at Hesdin in 1918. *Odontopera bidentata*: One captured at Hesdin in 1918. *Eurymene dolabraria*: A freshly emerged specimen taken at rest at Hesdin in 1918. *Angevra prunaria*: Common at Hesdin in 1918. *Amphidasya betularia*: A specimen, black save for the base of the wings, was found crushed by the roadside near Grand Rullecourt in 1916. *Phigalia pedaria*: One taken at rest near Albert in 1918. *Biston hirtaria*: Very abundant on the birches at Flixecourt in 1919. *Scotodia undulata*: One taken at Hesdin in 1918. *Sesia culiciformis*: Three taken in Beauval in 1918 and one at Flixecourt in 1918.—NORMAN C. E. MILLER; 66, Ellington Road, Rainsgate, Kent.

THE LEPIDOPTERA OF MACEDONIA.—The following additional and corroborative notes on the Lepidoptera of Macedonia may be of interest: *Manduca atropos*, twenty or thirty full-fed larvae, both brown and green forms, a mile or two north of Salonica (October, 1915). *D. euphorbiae*, full-fed larvae common on marshy ground, Struma Valley (July, 1916). *Chrysophanus dispar* (presumably var. *rutilus*), common, Struma Valley (July, 1916). *Nomiades semiargus*, locally common, Struma Valley (June, 1916). *E. argiades*, fairly common in one or two places, Struma (June July, 1916). *L. sinapis*, abundant among young maples, Hortiach Plateau (April-May, 1916).

—H. V. WILSON; 4, Percival Terrace, Brighton, June 3rd, 1919.

PARTHENOGENESIS IN *LYMANTRIA DISPAR*.—Last year my son, while a prisoner in Holland, obtained two larvae of *Lymantria dispar*—“The Gipsy.” These were kept in a large wooden breeding cage with wire gauze and glass sides. Two females emerged and laid their eggs on their silken cocoons. As he had no male he did not think more about them. Last May I noticed a lot of small larvae crawling about the cage: I looked in and saw some hundreds of larvae. I boxed a large number and put some whitethorn leaves in. They are all feeding up well on it and have now completed their second moult. I wrote to my son, who is a very careful observer, and asked him what these larvae were; he at once replied giving me full details. Now it was quite out of the question that any male moth had access to these two females, as the cages are very carefully made and were kept in the rooms the whole time. Is parthenogenesis at all common in moths? I may add that some years ago in India the same thing happened to me. I at once wrote up to the Bombay Natural History Society and was informed that it was not uncommon in the class of moth that I referred to. I do not remember the exact genus of the moth, but it was one very closely allied to the Lymantriidae. I would be very grateful to anyone giving me any information on the subject. I am absolutely certain of my facts. I can send larvae to anyone who would like to have them for experimental purposes as I have many more than I can deal with. I will when they emerge write again giving more particulars if desired, but it struck me as being of interest. R. H. RATTRAY (Col.); 68, Dry Hill Park Road, Tonbridge, Kent, June 9th, 1919.

NOTES ON THE LARVA OF THE PROTOPARCE CONVOLVULI.—I found eggs and larvae of this moth at Sheikh Othman, near Aden, in June and July, 1917. Most of these were on a climbing plant with fleshy,

heart-shaped leaves and a flower very like the convolvulus. The eggs were bright emerald green, spherical in shape, with a depression in the centre. The larvæ when hatched were light green and semi-transparent, with a straight black horn. When about a week old seven oblique stripes, white edged above with dark green, appeared on each side, and the whole body was covered with raised whitish dots. The horn was green with base and tip black. When about eleven days old all the larvæ changed to the brown form, which was coloured as follows: Head brown, striped with ochreous. General body-colour brown closely dotted with ochreous. Three longitudinal ochreous stripes on first three body-segments. Seven oblique stripes on each side; flesh colour edged above with brown. At the upper end of each oblique stripe one black and one flesh-coloured spot. Spiracles enclosed in a large black spot. Legs and horn black, the latter curved downwards. Prolegs flesh-coloured with a brown stripe on each. The larvæ reached full growth in about fifteen days, and were then nearly five inches long. They pupated a few inches underground in about twenty days from hatching. The pupa was bright reddish-brown, with a smooth, shiny surface, spiracles black, and the proboscis case dark brown. Moths emerged in about thirty days from the hatching of the larvæ. In the earlier stages, while the larvae were coloured green, they stayed on the green leaves of the food-plant all day and night. As soon as they changed to the brown colour they fed by night only, going down among the stems and fallen leaves before dawn, and coming up to feed after dark. They appeared to be distressed when exposed to sunlight, and hurried about looking for a place in which to hide. At Rae Bareli, U.P., I noticed an adult larva of this moth which was of the usual green colour, and this larva stayed on the leaves of the food-plant during the day and made no special attempt to conceal itself.—F. B. SCOTT (Capt., I.A.).

MOULD ON INSECTS.—I have always used the following plan for removing mould from Lepidoptera, which is probably well known, and certainly very effectual. Make a pellet of cotton-wool as big as a nut; fix it on the head of a fairly long pin. Pour on to the wool a few drops of carbolic acid (I have hitherto used the crude, black form); fix your pin in the drawer near the affected insect; the mould will disappear in a few days. I have found this plan answer so well that I am now placing carbolic acid applied in this way in all my drawers, using, however, the solidified form, as it is less unsightly. After melting the acid I soak the wool in it and then place the pin in a corner of the drawer.—H. D. FORD; Thursby Vicarage, Carlisle.

ASPILATES OCHREARIA IN CUMBERLAND.—It may interest readers of the 'Entomologist' to learn that there is a flourishing little colony of this moth in this district. Its habits are curiously local even in the restricted locality in which it dwells, as it confines itself to one portion of a damp meadow, its range being apparently only a hundred yards or so in length by forty or fifty wide. A friend of mine tells me that he has known of the existence of this colony for a long while. That such a colony should exist more than twelve miles from the sea and in the north of England is, I think, note-

worthy, as the insect appears to be almost exclusively a south county and sea-board species. Barrett speaks of a doubtful specimen, said to be taken near Silloth, in Cumberland. South says that "odd specimens have been reported from Cheshire and Cumberland."—H. D. FORD: Thursby Vicarage, Carlisle.

HESPERIA MALVA in DERBYSHIRE.—On May 30th, in a meadow adjoining a small spinney near Repton, I took a specimen of *H. malva* in fine condition, and four days later another in the same spot. The species had not previously been recorded for Derbyshire, and is, I believe, in general very scarce and local in the Midlands. It seems strange that it should have so long escaped notice in the very centre of a district that has been regularly and thoroughly worked for many years by a long series of collectors. The locality, in which *Potentilla* is abundant, is an ideal spot for the species, but I have myself frequented it for fifteen years without seeing the butterfly there before. H. C. HAYWARD, F.E.S.: Repton, Derby.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—May 8th, 1919.—ANNUAL EXHIBITION OF "OTHER ORDERS."—Mr. Stanley Edwards, Esq., F.L.S., President, in the Chair.—Mr. F. H. Wolley Dod, F.E.S., of Alberta, was elected a member. Mr. Frisby exhibited (1) *Vespa dorylloides*, an Eastern species nocturnal in flight, and (2) *Polyrhachis striata*, an ant armed with spines, from India.—Mr. Ashdown, a large number of Diptera set to show the wing markings, and pointed out that the pattern frequently showed no connection with the lines of venation. He also showed *Cassida nobilis*, from Oxshott.—Mr. R. Adkin, an original edition of 'The Herbal or General History of Plants,' by John Gerarde, 1597.—Dr. Chapman, living bred specimens of (1) the Solomon Seal Sawfly, *Phymatocera aterrima*; and (2) the Apple-boring Sawfly, *Hoplocampa testudinea*; the former gnaws its cocoon to escape, the latter cuts off a lid.—Mr. Dods, the "false scorpion," *Chelifer canceroides*, found among books in a warehouse.—Mr. South, various species of Coleoptera, Neuroptera, Odonata, Hymenoptera and Diptera taken by him in the New Forest during 1914–18 in June.—Mr. S. Edwards, numerous large species of exotic Coleoptera, Orthoptera, Bees, and Pseudo-scorpions.—Mr. L. A. Box, several species of Hymenoptera, including a specimen of *Rhyssia persuasoria*, the largest British Ichneumon, from Surrey.—Mr. H. Moore, several species of exotic centipedes from Burmah and *Polydesmus cingulatus* taken in Sicily by the late Platt Barrett.—Mr. B. Adkin, oak branches showing the ravages of the beetle *Scolytus intricatus*.—Mr. Leeds, *Eschna cyanea*, taken at Letchworth on April 27th, 1919.—Mr. West, four drawers of Hemiptera, and also the Hymenoptera *Osmia ranunculus* from Darenth, *Andrena fulva* from Box Hill, *Eucera longicornis* from Byfleet, and several *Chrysidae*.—Mr. Turner, some exotic Phasmids and Mantids.—Mr. Bennett, a queen bee with workers for comparison.—Mr. Tonge, the predaceous Diptera *Asilus erakromiformis* from Cornwall, and the bee, *Anthophora acervorum*, from Deal.—H. J. TURNER, Hon. Editor of *Proceedings*.

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INSECTS ON THE SEA BUCKTHORN.

BY FRED V. THEOBALD, M.A.

ON June 17th I visited the sandhills and coast on Romney Bay, with the hope of finding the only species of *Rhopalosiphum* known in Europe that I had not specimens of in my collection—the *Rhopalosiphum hippophaës* of Koch, described from the Sea Buckthorn (*Hippophaë rhamnoides*), a shrub which occurs on the coast in the south-east and east of England, and I believe in the north-east. It is found in patches between Rye and Littlestone and at Sandwich and Deal, looking much like a willow. After an hour's work I came across numerous colonies of this aphid, which occurred on the young plants and much concealed on the tips of the shoots. I could find none on the older bushes, at least along the borders of the clumps, and the long thorns prevent one going far into them. The colour of the aphid also makes it somewhat difficult to detect. Only apterous females occurred, with a few nymphæ.

In company with this Aphid were countless nymphæ of *Psylla hippophaës*, Först, which Edwards ('Hemiptera-Homoptera,' p. 243, 1896) only records from Winterton, Norfolk and Deal (Scott). The nymphæ brought home became alate from June 24th onwards. They are not nearly as active as *P. mali*, or *P. pyricola*, which is, I find, common and widely distributed on the pear, but not injurious with us as it is in America. The nymphæ were also difficult to detect, except that their presence was shown by the mealy oil-globules so characteristic of these insects.

The most interesting insect, however, found on this shrub was the Brown-Tail Moth (*Euproctis chrysorrhœa*), which occurred in thousands on all the patches. One large growth had been completely stripped and looked as if it had been burnt, save for the countless larval tents—both the small winter tents and the large summer ones. Some of the winter tents were six inches wide and equally long, and spun up in quite a different manner to those I have found on the apple. Many of the larvae were pupating and a few pupæ already occurred. One cocoon

cluster brought away contained no less than forty cocoons, but the majority consisted of from seven to fifteen. All as usual were covered by a loose, dull, reddish-brown, coarse silk—so different from that which forms the winter and summer larval tents, which is dirty grey. Some larvae, however, were not much more than half grown. Many years ago I remember it defoliated the Sea Buckthorn on and near Rye Golf Course. I have also on many occasions taken a few tents of larvae at Sandwich and Deal, but have never seen such countless masses of the larvae as occurred near Littlestone since its well-known attack on the fruit plantations of East Kent in 1901. About



Sea Buckthorn defoliated by the Brown-Tail Moth, showing "tents."

the same time I visited these sandhills in 1915 and found only three tents—one at Rye and two at Littlestone. Capt. A. Duffield, M.C., who was collecting with me, found this moth occurring in great numbers on the coast across the Channel. It appears to be a littoral species, and its occasional outbreaks inland do not last long. Yet its introduction into America seems to show it can flourish far away from the sea.

In spite of a good wind blowing and moving about amongst the younger growths, I found no ill-effects from the "urticating" hairs of the larvae; on the other hand, Capt. Duffield suffered from this well-known form of pseudo-urticaria.

Besides this moth there were also many larvae of the Gold Tail Moth (*Porthesia similis*). I also brought away two other caterpillars which occurred in small numbers, both unknown to me.

Kaltenbach ('Die Pflanzenfeinde,' p. 521, 1874) lists the following insects on this shrub: *Graptodera hippophaës*, Aubé; *Vanessa v-album*, Gmel; *Deilephila hippophaës*, O.; *Gelechia acupediella*, v. Heyd; *Capsus hippophaës*, Mey.; *C. rhodani*, Mey.; as well as the Aphid recorded here.

Houard ('Les Zoocécidies des Plantes d'Europe,' tom. sec. p. 749, 1909) also records *Eriophyes hippophaënus*, Nalepa, *Psylla phæoptera*, F. Löw, and *Trioza binotata*, F. Löw.

It will be interesting to see if any parasites occur amongst the Brown-Tail Moth in this area. I brought away some hundreds of larvæ for this purpose. Numerous parasites have been recorded attacking it in Europe, but the only one I bred from great numbers of larvæ collected in 1901 in the orchards of East Kent was the Tachinid fly, *Thelymorphia vertiginosa*, Fl., which undoubtedly was the prime agent in stamping out what was for a short time a serious pest in the Kentish fruit plantations (*vide* 'The Insect and Other Allied Pests of Orchard, Bush and Hot-house Fruits,' pp. 22-26, 1909).

NOTES ON BRITISH ORTHOPTERA IN 1918.

By W. J. LUCAS, B.A., F.E.S.

DURING the season of 1918 the notes of chief interest in connection with our Orthoptera are concerned with the Acridians. Of the other sub-orders but little information has come to hand.

FORFICULODEA (earwigs).—On August 13th I looked for *Labidura riparia*, Pallas, on the shore between Southbourne and Pokesdown, but after a long search found only two nymphs. The next morning the larger of the two was found to have eaten its companion. The former was kept alive till October 20th, when in the evening it seemed to be moribund, so it was killed and mounted. Perhaps its food was not satisfactory, or possibly it ought to have hibernated out-of-doors. The capture proves that so far the species had not quite disappeared from the Hampshire coast. South took a *Forficula auricularia*, Linn., var. *forcipata*, Steph., in August at Harpenden, Herts.

BLATTODEA (cockroaches).—A female *Ectobius lapponicus*, Linn. was captured on August 6th in Pound Hill Inclosure, New Forest, on the ground amongst the stems of *Juncus communis*, Meyer. On January 27th, a damaged and nearly dead *Periplaneta americana*, Linn., was found on the floor of the large reptile-house at the Zoological Gardens, Regent's Park. What an excellent breeding-ground the warm houses in the Gardens make for this species!

GRYLLODEA (crickets).—The only note on this sub-order is that *Nemobius sylvestris*, Fabr., was found near Gritnam in the New Forest on August 12th.

LOCUSTODEA (long-horned grasshoppers).—On August 23rd, on the shore between Barton and Mudeford, Hants, at the foot of a nearly perpendicular sandy cliff, I found several specimens of *Metrioptera albopunctata*, Goeze. The cliff sloped somewhat at the base and there bore a little scattered vegetation (chiefly brambles), and it was amongst this that I caught the grasshoppers. When disturbed they hopped hurriedly out and were easily turned on to soft sand, where they struggled along with hops of decreasing length, which at length became a crawl. In fact, these usually active insects became almost helpless, and I was able to secure them with my fingers. The dull grey colour of *M. albopunctata* agreed well with the surroundings in which these were found. I eviscerated one of the females taken and found several eggs, some being black and apparently ready for laying. Would they be laid in the sand or the very dry, sandy soil? The surroundings seemed decidedly barren for very small newly-hatched nymphs. In shape the egg was cylindrical, with rounded ends, not quite straight, and one end a little more blunt than the other. The length was about 4 mm. and the breadth about .8 mm. Its colour was black (dull yellow when immature); the surface was more or less shining, not quite smooth, but without definite markings. A. E. Tonge took a female *Phasgonura viridissima*, Linn., on October 6th at Westcott rifle-range, near Dorking (Pickett's Hole). He had not met with the species previously in Surrey. When eviscerated it was found to contain some 23 eggs, most of them apparently ready for laying. On October 19th, in the Home Park, Hampton Court, Middlesex, I found on trunks of lime trees two females of *Meconema thalassinum*, De Geer. They were a foot or two from the base of the trees, and probably were there for the purpose of ovipositing.

ACRIDIODEA (short-horned grasshoppers).—On April 27th I went to Marlborough Deep in the New Forest to search for *Tetrix subulatus*, Linn., and found the species to be plentiful, especially in one spot. They were on ground rather sparsely covered with short grass, and other small plants near the ponds and damp places. I feel certain that all were mature. As the species was also adult in the autumn, the fact of their hibernating as imagines is established without any doubt. As I had no net I boxed them, or caught them by hand, but found them very difficult to follow (particularly the small dark males), especially as little black spiders were running about on the ground, and a small black fly was sometimes flitting above it, while other small insects kept rising also. In the bright sunshine they got up on the wing in all directions and flew two or three yards, or even more, at a time. It must be true flight, as they could sustain themselves on the wing and turn in the air. The latter they did to avoid some object, or the water as it appeared. They did not, however, mind a "ducking," and swam quite well below the

surface of the water, propelling themselves by means of their hind legs. The passing of a cloud over the sun seemed sufficient to prevent them taking to the wing. If a particular example was followed, its flights appeared to become less and less strong, as is perhaps the case with other grasshoppers. Specimens varied greatly in colour and conspicuousness, one of a greenish tint having a very pretty appearance. A fairly constant form has a pale pronotum, which, being interrupted by the two triangular dark spots near the base of the wings, causes the dorsal surface of the insect to assume a dagger-like appearance. It may therefore appropriately receive the varietal name of *stylifer*. Of the specimens of *T. subulatus* put into the laurel-bottle thirteen were females and six males; but the females are much more conspicuous than the males. *Tetrix bipunctatus*, Linn., was first seen on March 23rd, when imagines were about at Prince's Coverts, near Claygate, Surrey. Three specimens were captured, all females. On April 24th five were collected in the neighbourhood of Aldridge Hill, New Forest—four females and one male, all being mature. On April 27th this species was infrequent at Marlborough Deep. It was common on May 19th at one spot on the southern slope of Boxhill, Surrey. On June 15th one was taken mature near Horsley (W. J. Ashdown). One small male and two females were captured near Dorking on October 24th (T. A. Chapman).

One male example of *Gomphocerus rufus*, Linn., was taken near Dorking on October 24th (Chapman). On August 5th *Gomphocerus maculatus*, Thunb., was captured at Arthog in Merionethshire (E. B. Nevinson). A dead female of this species was found on August 19th in the New Forest, holding on to grass-blades, as in life.* It was somewhat distended, but there was no apparent cause of death. It fell to pieces at home in the evening, so I presume it had not recently died. The last specimens for the season noted were two females on Netley Heath on October 26th (L. C. E. Balcomb).

On July 28th a male imago of the fine bog-loving grasshopper *Mecostethus grossus*, Linn., was taken by Apsley "shade-pond," near Oberwater in the New Forest. The next day a few imagines were met with in the upper part of Duck Hole Bog: one captured was a small male. On August 8th it was very plentiful at Denny Bog, and six males and three females were taken casually as I was looking for *Utricularia intermedia*, Hayne. Large numbers could easily have been secured. On eviscerating the females one only was found to contain eggs—large and yellow, apparently not yet ready for oviposition. At the upper part of Duck Hole Bog I saw a number on August 9th, and took one male. On August 30th a female was captured on Ober Heath, some quarter of a mile I should say from the nearest bog, such as those on

* *Vide* vol. xliv, 1911, p. 211.

which I usually get the species. On August 31st, although it was not bright at Denny Bog, *M. grossus* took to the wing sometimes, and one or two were captured. On September 1st I secured a small male by the shade-pond at the Apsley Passage of Oberwater, and feel certain I saw another specimen.

Stenobothrus lineatus, Panzer, was scarce on October 24th near Dorking, but two males and one female were taken (Chapman). *Omocestus viridulus*, Linn., was captured at Arthog in Merionethshire on August 5th (Nevinson).

Specimens of *Stauroderus bicolor*, Charp., were taken at Arthog on August 5th (Nevinson). Three of these—two males and one female—had blackish dorsal surface, including elytra, and yellowish legs. On August 28th I took a female similar to these near the Verderer's Bridge over Blackwater in the New Forest. On the dorsal surface the head, thorax and fore part of the elytra were nearly black, the hind part of the last becoming greyer. The legs and sides were yellow-ochre, the under-surface greenish-yellow, the antennæ pale and somewhat rosy. The arrangement of the yellow and dark brown colours in longitudinal lines gives this form a very distinctive appearance, and it may suitably be named var. *longitudinalis*. Another female taken at the same time and place was of a beautiful dull rosy tint above and yellowish-green below. A specimen, striped with pale yellow, was brought away from the shore between Barton and Mudeford on August 23rd; it was a striking and conspicuous form, suitably coloured for protection on the pale sand of the locality. On September 2nd, in the damp, somewhat boggy ground facing Holmsley Station in the New Forest, I found *Chorthippus elegans*, Charp., pretty plentiful, and took a good number of both sexes, including a female with bright rosy dorsal surface—head, thorax and elytra. The antennæ also were partly rosy.

As mentioned above the last date for the season with which I am acquainted was October 26th, when *Gomphocerus maculatus*, Thunb., was met with on Netley Heath in Surrey.

Kingston-on-Thames,
July, 1919.

THE COTTESWOLD ARION.

BY H. ROWLAND-BROWN, M.A., F.E.S.

I HAD never seen *Lycæna arion* alive in England, and when I received instructions to transfer myself to Gloucester towards the end of June visions of the Large Blue loomed larger in imagination. Mr. G. T. Bethune-Baker, writing to me on the eve of my departure, rather mitigated the glory of my dream. "The form on the hills" at a certain place he was good enough

to indicate "is only worth going for as evidence of degeneration. . . . A Birmingham man was over there just before the war, and the form he found there was not uncommon, but reduced in size and coloration most extraordinarily; and this was not from one year's taking only. It seems to me a very unusual case, and one cannot quite account for it."

On arrival at Gloucester the weather was all that could tempt the quarry abroad. The season was backward, and this was in my favour. But I had hardly been two days in that ancient city when the weather broke: grey skies and "a rushing, mighty wind" succeeded the universal calm blue; and when I found myself at what I expected to be the appropriate locality, not an insect was flying. A few *Anthrocera trifolii* clung tenaciously to the flower-heads and as many disconsolate *Cænonympha pamphilus* rose from the rough grass. The ant-hills of *Myrmica scabrinodis* were there, the heaps sparingly invested with *Thymus serpyllum*. On the way out a passing cyclist had disturbed a privet bush, from which rose several *Thecla w-album*, as it seemed, and that was all. I prowled about for a couple of hours until I was fairly blown off the ground.

So much for June 26th; and the prospect of the next day was hardly more encouraging when I admitted daylight through the window of the very ancient inn which has housed pilgrims of all sorts for the past five centuries. I may add that the only conveyance available was a pre-war "push-bike," the property of the boots—a small man whose legs must have been some inches shorter than mine. I am not likely to forget this "infernal machine." I did most of the pushing myself up the Cotteswolds, and even more wearisome was the labour of holding back on those downward "shoots" which land you from the heaven-kissing hills to the valley beneath—on your head if you are not cautious to exasperation. However, things went very differently on the 27th. The wind was more than a cap-full, but I had the cheerful company of Mr. C. Granville Clutterbuck as guide, philosopher, and friend, and I owe it to him entirely that I realised my dream, and achieved the felicity of observing *L. arion* in its native haunts. We should have done better had the sun been a little more prodigal of its favours. At all events, there were intervals of brilliance; and then the several hill-sides visited were alive with Lepidoptera of all sizes—at least, so Mr. Clutterbuck assures me, for his activities centred upon the "micros," and judging from the rapidity with which he wielded his net he should have bagged a plenty of the "wee folk." A prolonged study of Army Forms for the past five years must have impaired my sight, for I simply couldn't spot the most obvious Tineid, or appreciate on the wing the elusive Tortrices which my companion boxed and boxed again as it were from thin air.

The Cotteswold country in which *arion* lingers closely resem-

bles certain places, loved of old, in the Basses Alpes, places where the flora and vegetation is scanty, and the only accompanying Lycaenids are *Cupido minimus* and *Nomiades semiargus*. Who in Gloucestershire is going to restore the "Mazarene Blue" to the British list from which some of us once on a time were preparing to delete *arion*?

I have so often found that I get my best captures by seating myself and taking a wide horizon that I was scarcely surprised when Mr. Clutterbuck, who was sitting beside me—on an ant-hill—suddenly cried out "There's *arion*!" The stiffness engendered by that cursed bike dissolved like magic, and in a moment I had the pleasure of taking a fine, newly emerged male in my net. It appeared to be the only occupant of this particular terrain, and as the prospect was now distinctly more encouraging we migrated to an entirely different range of hills, round whose feet the beech-woods and larches clustered temptingly, with "rides," in the distance like to green ribbons, intersecting the greater forest.

How often in the days that are no more have I carried my net to such "fresh woods" and emerged unexpectedly into the land of the entomological heart's desire. Rare orchids haunt these plots "of beechen green, and shadows numberless," the witch-like *Orobanche*, and the wicked-looking "toothwort." From such a spray my companion had taken a remarkable *Plusia* which I will leave him to describe: *Abraxas ulmata* was the sole tenant to-day.

Debouching from the woods, in a sheltered amphitheatre protected here by the rising slopes and there by the ring of beeches, I presently was ushered into one of the finest butterfly corners I ever met with in this country. Had the weather been less fickle I might have made a big bag. A shower descended, splashed the whole hill-side with diamonds, and then the sun shone hotly for a few minutes at a time. At once the landscape was alive with insects of all Orders. *A. trifolii* was in force, and what I take to be *A. loniceræ*. Males of *Argynnis adippe*, fresh from the pupa, darted madly up and down the slope with occasional females. *Melanargia galatea* was also coming on, and *Aphantopus hyperanthus*; and presently single examples of *L. arion* put in a welcome appearance, for the most part in perfect condition, while Mr. Clutterbuck picked up one or two from the meagre thyme clumps on the ant-hills.

I can find no evidence of the deterioration in size and colour mentioned by Mr. Bethune-Baker as observable in specimens from some other Cotteswold localities. The Cotteswold *arion* is, indeed, a much less brilliant insect than the Cornish—just the difference, as it seems to me, as you find on the Continent between the *arion* of the oolite, lias, and volcanic regions and those from the limestone and calcareous formations. I have a

short series from these very Cotteswolds collected by the late Herbert Goss. They are nearly all dull in colour and below normal size—one or two quite small—and I have not come across any such in the many haunts of *arion* abroad which I have visited. I find that they were collected on or very near to the ground more particularly indicated to me by Mr. Bethune-Baker, and at a considerable distance from the locality under review. The *arion* we took on June 27th are quite up to normal English size, and are no less brightly coloured than many from Digne, and comparatively low altitudes off the chalk elsewhere: slaty, but not dull. Under more favourable weather conditions I have no doubt we should have found the species not uncommon, for Mr. Clutterbuck had been on the look out a week previous, and I saw his captures still on the setting-boards.

The only other blues observed here were belated *Polyommatus icarus*—hardly of the second emergence I suppose, though they were quite fresh, and *Cupido minimus*—by far the commonest of the three.

The mystery of the life-history of *arion* has now been cleared up in its essential details. Those interested in the phenology of the Gloucestershire form may be referred to the records given by Mr. Clutterbuck in his note on "The Large Blue Butterfly (*Lycæna arion*) on the Cotteswold Hills" ('Proc. Cotteswold Nat. F.C.', vol. xviii (2)), read April 1st, 1913. They are, I think, independent of and supplementary to the dates set out in Tutt's 'British Butterflies' (vol. iv, pp. 345–6), in which work, I observe, the hills are spelt "Cotswolds" throughout, and a decided query raised as to the food-plant of the larva consisting of any other plant than *Thymus serpyllum*.

Sand apparently confused the larva of *L. alcon* and *L. arion*, if he ever had any personal knowledge of either at all, when he gave "chenille en juin dans les fleurs de "Gentiana cruciata." Quaedvlieg's "leguminosæ," quoted by M. C. Friornnet ('Les États des Lépidoptères français, p. 132) appears to be an even wilder guess on the assumption that other Lycænidæ affect those plants, while the authority for *Origanum*, questioned by Mr. Wheeler in Tutt's work (*loc. cit.*, p. 340), appears not to be M. Rondou, but Mr. Bromilow, with whom I had some correspondence in the early "nineties," and who was then collecting in south of France. All he says, however, in his 'Butterflies of the Riviera' (p. 48), is that "the females, especially, swarmed on the flowers of *Origanum vulgare* (Wild Marjoram), *to all appearance laying eggs.*" (The italics are mine.) Here, at any rate, he does not say that he saw the eggs laid. As a crowning error of transcription, Rühl ('Die. Pal. Grosse Schmetterlinge,' Bd. i, p. 307) easily comes in first. His locality, "South Devon, bei Huddersfield," must have caused considerable amusement to Mr. G. T. Porritt, who had contributed some notes on *arion* to

the 'Ent. Mo. Mag.' German intimacy with British topography was, perhaps, not so precise in 1895 as in 1914.

Mr. Clutterbuck informs me that "micros" observed by him on the 29th included *Acrilepia subbaumanniiana* amongst or near Scoteh firs, *Caloptria hypericana* amongst *Hypericum*, *Coleophora lariciella* amongst larches, *Prays curtisellus* at ash, and *Glyiphapteryx fischeriella*, with *Alucita tetradactyla* on thyme, and *Pterophorus pterodactylus* (= *fuscus*) ; the latter also I found commonly all over the hills in suitable localities, while I may add that the leaves of the Black Mullein (*Verbascum nigrum*) had been riddled by the larvae of *Cucullia verbasci*, several of which, full-fed, were brought back in our tins.

Harrow Weald,
July 13th, 1919.

CONTRIBUTIONS TO OUR KNOWLEDGE OF THE BRITISH BRACONIDÆ.

No. 4.—RHOGADIDÆ.

By G. T. LYLE, F.E.S.

(Continued from p. 155.)

Genus 4.—*Petalodes*, Wesm.*

Like *Clinocentrus*, Hal., the suture of the 2nd-3rd abdominal segment is obsolete, in which the two genera differ from other *Rhogalidæ*. Although agreeing in this they differ widely in other respects : *Clinocentrus* has the abdomen not longer than the head and thorax combined, while in *Petalodes* it is considerably longer. A single species only is known, the male of which might easily be passed over as a pale *Rhogas* ; the female, however, is readily recognised by the strongly compressed abdomen.

Unicolor, Wesm.†

A rather pale testaceous insect with short antennæ. Marshall says there is a fuscosus patch on the metathorax, but this does not agree with my specimens, all being entirely testaceous excepting the antennæ towards the apices, eyes, stemmaticum, claws, valves of the terebra and a dot above each radix. Antennæ of female 31-34-jointed, of the only male I have seen, 37-jointed. In Britain only recorded so far from the New Forest, where it seems to be not uncommon, for I have several times reared it from half-grown larvae of *Hydriomena furcata*, June 4th to 12th, once from a *Xanthia* larva, June 7th, 1911, and from *Pygea pyra*, July 22nd, 1916. Norgate also bred it from the last-named. It will be noticed that all these widely separated hosts are sallow-feeding species. In all I have bred a dozen or so

* Lib. cit., p. 123.

† 'Nouv. Mém. Ac. Brux.', 1838, p. 123.

females but only one male. The species has precisely the same habits as *Rhogas*, undergoing its metamorphosis within the indurated skin of the host.

Genus 5.—*Clinocentrus*, Hal.*

A small genus of moderate sized but little-known insects, distinguished from neighbouring genera by the obsolete suturi-form articulation and exserted terebra of the female. Apparently scarce in some parts of the country, otherwise so ardent a collector as Bignell would certainly have obtained them in Devon, yet so far as we know he found none. During my several years in the New Forest not a single specimen occurred to me, though Dr. Sharp and Morley have each taken an example in that locality. After my experience in the Forest I was somewhat surprised to find in 1917 one species in very considerable numbers and others more sparingly on the Gog Magog Hills near Cambridge.

Our knowledge of the life-history of these insects is very scanty. Von Vollenhoven tells us that several *C. excubitor* were reared from pupæ of *Noctua diatrapezium*, and Elisha bred *C. exsertor* from *Hedya neglectana* as recorded by Marshall, but unfortunately no particulars are given as to whether the insect emerged from the hardened skin of its host or not. The genus certainly differs rather widely from the other *Rhogadidæ*, so much so that Ashmead removed it from the tribe and included it in his *Rhyssalinit*, while Thomson placed it with the *Exothecides*. A better knowledge of the habits of these insects might do much to decide the true position of the genus.

Exsertor, Nees.†

Probably the commonest species we have. I found it fairly abundantly in a lane on the Gog Magog Hills, Cambridge, in July, 1917, though in 1918, careful collecting in the same locality and at precisely the same time of the year failed to yield a single specimen. I have also obtained it at Chesterton Fen (August 1st, 1918) and the Fleam Dyke (August 11th, 1918), both near Cambridge.

Marshall gives the antennæ as 31–36-jointed, though I have seen none with less than 33 or more than 35 joints. In a few of my specimens the third abdominal segment has a rufous tinge; in the great majority, however, the upper surface of both thorax and abdomen is entirely black; in all the hind coxæ are more or less infuscated above. The terebra is rather more than two-thirds as long as the abdomen; this agrees with Marshall, but Nees, in the original description, says—“*Terebra longitudine dimidi abdeminis*.”

* ‘Ent. Mag.,’ i. p. 266 (1833), iv, p. 94.

† ‘Classification of Ichneumon Flies,’ p. 142.

‡ ‘Mon.,’ i. p. 207.

Striolatus, Thoms.

I must refer to this species an insect taken on the Gog Magog Hills, Cambridge, on July 8th, 1917. It agrees with Thomson's description in having the 3rd abdominal segment "acciculato-punctato," but has the terebra two-thirds as long as the abdomen. The first three abdominal segments are coarsely and irregularly striolate with punctulate interstices (in which it differs greatly from *exsertor*, Nees) : metathorax rugulose ; orbits and lateral lobes of mesothorax rufescent ; legs testaceous, hind coxae dark, all the tarsi, hind femora and tibiae apically piceous, middle femora and tibiae also darker at the tips ; stigma fuscous with rather more than the inner third flavous ; antennae 34-jointed.

The only other British specimen so far recorded was taken in Suffolk in 1899 by Morley, who informs me that it has similar dark markings on the legs ; this is a character not mentioned by Thomson.

Gracillipes, Thoms.*

First recorded as British by Morley, who mentions two specimens—one taken at Greenings in 1872 and the other at Appledore in 1900. The species seems to be rare and I have only once met with it, namely on May 16th, 1910, when a female was taken by sweeping hawthorn bushes at Beeton Bunny on the Hampshire coast. In this example the third abdominal segment is pale testaceous at the apex while the following segments are entirely of that colour ; the antennæ are dark above with the exception of the extreme base of the first joint of the flagellum ; 33-jointed. According to Thomson it is easily distinguished from *cunctator*, Hal., by the greater length of the second abscissa of the radius when compared with the first.

Excubitor, Hal.[†]

On June 3rd, 1917, I captured two females on the Gog Magog Hills, Cambridge, and on June 6th, 1918, a single male in a lane at Hunstanton, Norfolk. These insects would agree exactly with Haliday's description but that the third and following segments are not apically pale in the male and one of the females ; this slight colour variation is, however, of little moment. Antennæ 33-34-jointed. The male has the mesothorax centrally rufescent. Hind femora entirely pale testaceous. A larger insect than *tenuicornis*, Thoms., and the median spiracles on the first abdominal segment are much smaller.

Tenuicornis, Thoms.

An addition to our British list : a single male was swept from grass on the Gog Magog Hills on July 8th, 1917. Distinguished

* "Opus Entom."

† "Ent. Mag." iv, p. 94.

by the *very* prominent median spiracles on the basal segment of the abdomen. In my specimen the striolæ at the base of the third abdominal segment are transverse; hind femora tipped with black, stigma fuscous, with the inner angle flavo-testaceous; antennæ 37-jointed.

SOME NEW RHOPALOCERA FROM BRAZIL COLLECTED
BY E. H. W. WICKHAM, ESQ.

By N. D. RILEY.

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THROUGH the kindness of the Rev. A. P. Wickham I have recently been able to examine a large collection of Rhopalocera, made by his son between May and December, 1913, on the Madeira and Purus Rivers and some of their tributaries. The collection was especially rich in Ithomiinæ, this subfamily including the bulk of the new forms here recorded. Mr. Wickham has generously presented all the types to the Museum and a large selection from the remainder of the collection.

NYMPHALIDÆ : ITHOMIINÆ.

1. *Melinea hicetas brunnea*, ssp. nov.

♀. Differs from typical *M. hicetas*, Godm. & Salv., in the darker brown of both wings above and below; in the fore wing above, in the considerable restriction of the postcellular transverse brown band and in having a tawny yellow spot in the anal angle, below, in the breaking-up of the black markings in the apical half of the wing by considerable brown scaling; in the hind wing, above, by the absence of the submarginal band of black spots and the restriction of the median band to a suboval smoky patch between veins 4 and 5, the usual black spot between veins 5 and 6 being present and almost joined to the broad black costal band which extends from it to the base. The hind wing shows rather more traces of the median black band below than above.

Bocca de Acré, Upper Purus, December, 1913.

2. *Melinea hicetas purusana*, ssp. nov.

♂ ♀. Similar in pattern to *M. hicetas brunnea* but with the ground-colour deep chocolate brown, black markings more extended, the subapical spots, postcellular transverse band and anal spot of fore wing all pure yellow. The hind-wing median band of black spots complete but not very broad. Markings below as above, but a considerable brownish suffusion in the black markings of apical half of fore wing.

Allianca, Canutama, Rio Purus, September, 1913; also from Sebastopol, Labrea, Rio Purus, October, and Abuna, Upper Madeira, October.

This form appears to be intermediate between *M. hicetas brunnea* and *M. madeira*, Haensch., from Manicoré and L. Madeira.

3. *Mechanitis risenda elerata*, ssp. nov.

♂ ♀. Ground-colour of both wings darker than in typical *risenda*. The black markings of fore wing except apical patch considerably extended but not confluent, causing the constriction of the postcellular yellow transverse band, which is characterised by its tooth-like projection between veins 5 and 6 as in *M. fallax*, Butler.

Allianca, Canutama, Rio Purus, September, 1913; also occurs at Ega and Fonteboa, Upper Amazons.

Butler's type of *M. risenda* came from Trovador on the R. Tapajos. This race appears to be its representative on the upper reaches of the Amazon and its tributaries.

4. *Mechanitis egensis contracta*, ssp. nov.

♂ ♀. Differs from typical *M. egensis*, Bates, in the fore wing in the absence of the fulvous subapical suffusion and in the clearly defined subapical short yellow transverse band; in the hind wing in having the median black band clearly differentiated and nearly parallel-sided, the marginal black border very narrow. Below there are traces on the fore wing of the brown subapical suffusion, and the hind-wing median band tapers proximally more decidedly.

Allianca, Canutama, Rio Purus, October, 1913.

5. *Ceratinia wickhami*, sp. nov.

♂. Ground-colour chocolate brown. Fore wing with black markings on inner margin, between veins 2 and 3 below cell, in basal two-thirds of cell and on cell-end, all very heavy. The transverse postcellular band is bright yellow and divided into three parts by the junction of the marginal black border with the lower black spot at cell-end, i.e. it is made up of a narrow zigzag band extending from just beneath the costa to midway between veins 4 and 5 half-way between cell and hind margin, a small irregular spot close to the cell from above vein 4 to vein 3, and a larger oval spot distally from this extending slightly below vein 3. There is a small indistinct brownish subapical spot and some yellow sealing anteriorly in the brown marking in the cell. Hind wing with fairly broad plain median band, margins very narrowly black. Underside similar, both wings with small and rather indistinct submarginal white spots, fore wing with slight subapical chocolate-brown suffusion.

♀. Similar, ground-colour rather lighter, fore-wing transverse postcellular band divided into halves only. Hind-wing median band less clearly defined.

♂. Allianca, Canutama, Rio Purus, September, 1913;

♀. Bocea de Aeré, Rio Purus, December, 1913.

The species shows considerable variation. It shows considerable tendency to *C. manaos*, Bates, whilst the fore-wing transverse band has the marked distal projections of *C. viola*, Hænsch.

6. *C. wickhami f. clara*, form. nov.

♂. Ground-colour light brown, fore-wing black discal markings smaller, transverse postcellular yellow band complete and broader than in typical form, subapical brown spot absent. Hind-wing median band reduced to a cloudy patch below cell from vein 3 to just beyond vein 4. On underside the marginal white spots are obsolete on hind wing, very faintly present towards apex on fore wing.

Bocca de Acré, Upper Purus, December, 1913.

7. *C. wickhami f. bicolor*, form. nov.

♀. Ground-colour and black markings of both wings as in typical ♀; transverse post-cellular band of same colour as ground-colour, not yellow; subapical brown spot absent. Underside as in typical ♀, but with subapical brown suffusion much reduced and marginal white spots of both wings more fully developed.

Bocca de Acré, Upper Purus, December, 1913.

8. *C. anastasia medea*, ssp. nov.

♂. Ground-colour of the chocolate brown so typical of the Middle Purus and Madeira region. The area beyond the pure yellow band on fore wing is pure black except for the seven submarginal yellow spots, not suffused with brown. The ground-colour extends to the anal angle, being separated by a large oval black spot from the transverse band, which stops abruptly on vein 3. The hind-wing median band is clearly defined, the marginal black border being reduced so as to be almost imperceptible. On the underside there are signs of brown subapical suffusion on fore wing, otherwise as above.

Allianca, Canutama, Rio Purus, September, 1913.

9. *C. pardalina flavigera*, ssp. nov.

♀. Readily separable from typical *C. pardalina*, Hopff., by the deep chocolate-brown ground-colour, the slightly greater development of the fore-wing black markings, the presence of a very sharply-defined transverse yellow band broken up exactly as in typical *C. wickhami*, and the presence of a further yellow band proximally, extending across the distal half of the cell and half-way to the anal angle, also very sharply defined.

Sta. Maria dos Marmelos, Lower Madeira, May, 1913.

This form is most like that occurring in the neighbourhood of Ega, in which the transverse band is always complete and the transcellular band only incipient (? = *pantherina*, Staud.).

10. *C. fulminans virgilini*, ssp. nov.

♀. Similar to *C. fulminans saturata*, Haensch., but with ground-colour lighter brown, the black markings in basal half of fore wing as in typical *fulminans*, the black spots at end of cell and the apical black area rather more developed, so that the transverse post-cellular band, which is brown, not yellow, is very much constricted and nowhere more than 1.5 mm. wide. The submarginal yellow spots are reduced

to three in the apex. Hind wing with no trace of median band, margin very narrowly black. Underside similar, hind wing with two minute white marginal spots at apex.

Senna Madureira, Upper Purus, December, 1913 (Dr. Virgílio).

11. *Calloleria selenoides paciloides*, ssp. nov.

♂. Ground-colour smoky-brown semi-transparent, in the fore wing restricted to subcostal and median veins, vein 2, and a small area just beyond centre of cell. Costa, apical area, hind margin and margin and a large spot centrally between veins 3 and 4 joined to hind margin, smoky-black. The yellow transverse band broad, running out to sharp projections between the veins and extending to vein 3 on each side of black spot. Hind wing with broad simple median black band, the marginal black border reduced to a series of internervular lunules. Underside as above, but with 4-6 submarginal white spots on fore wing, 5-7 on hind wing, between the veins.

Allianca, Canutama, Rio Purus, September, 1913.

12. *C. cayana*, Salvin.

The occurrence of this species in the collection from Senna Madureira, Upper Purus, is worthy of record, it having previously only been met with in Cayenne. Only one specimen was received, but it is inseparable from the type specimens of *C. cayana*, with which it has been compared.

13. *Leucothyris denuda*, sp. nov.

♀. Wings transparent. Fore wing with costa, hind and inner margin black; in cell a trace only, consisting of a short black mark anteriorly, of transverse black band. This is followed by a narrow faint milky band extending to the black border at the anal angle and a broad black band across cell-end tapering evenly to anal angle. These, again, are succeeded by a broad even milky band and a brown subapical patch of equal width continued as a narrow line to the anal angle. Hind wing with narrow black border with internally a brown line of equal width black-edged, both tapering evenly from apex to vein 1a.

Senna Madureira, Upper Purus, December, 1913.

Closely allied to *L. tigilla*, Haensch., but easily distinguished by the width of the brown subapical patch, the uniformity of the milky-white band, and the reduction of the black band in cell to a small spot.

14. *L. onega bocca*, ssp. nov.

♂. Fore wing black; a wedge-shaped transparent area filling basal half of cell, followed by a narrow triangular transparent area leaving the black band separating these two areas in line with vein 2. A transparent area fills the central half of the space between veins 2 and 3, above which a large suboval milky-white patch reaches almost to costa, conforming to shape of cell-end. Hind wing transparent with

black border, about 2 mm wide, containing slight traces of red-brown markings as in typical *L. onega*, Hew. Underside as above, but fore wing with narrow red-brown submarginal border on hind margin only; hind wing with similar border extending from base round costa to anal angle. Both wings with three milky oval marginal spots in apex, each spot divided into two by a vein.

Bocca de Aeré, Upper Purus, December, 1913.

A single male taken at Allianca shows a slight tendency towards typical *L. onega* in the extension of the black markings of both wings.

LYCOREINÆ.

15. *Lycorea ceres* f. *transiens*, form nov.

♂. Ground-colour fairly dark brown, intermediate in shade between typical *L. ceres*, Cram., and f. *cinnamomea*, Weym. Fore wing markings exactly as in typical *ceres*, hind wing as in typical f. *atergatis*, Dbl.

Manicoré district, Lower Madeira, June, 1913.

An interesting intermediate between the three main forms of this species. The commonest form by far on the Lower Madeira is *atergatis*. There is, however, in this form a distinct step towards the deep chestnut brown of *cinnamomea*, so characteristic of many Ithomiinæ of this district. I have seen no typical *ceres* from the R. Madeira.

16. *Lycorea pasinuntia* f. *brunnea*, form. nov.

♂. A distinct and not uncommon form, in which the brown of the basal half of the fore wing has extended throughout all the pale markings of the fore wing, even the subapical spots being tawny, though slightly paler than the rest.

Sebastopol, Labrea, Rio Purus, October, 1913.

This form also occurs at S. Paulo d'Olivencia, U. Amazon. I have seen no intermediates.

HELICONIINÆ.

17. *Heliconius melpomene* madeira, ssp. nov.

♂. Above as in *H. m. thelxiope*, Hubn., but with the yellow markings of fore wing beyond the cell arranged in a semicircle, not in the form of a band, so that, in conjunction with the large yellow area at the end of the cell the whole yellow area has a roughly subquadrate appearance, the spots being, however, fairly well separated by black; those between veins 2, 3 and 4, however, not so distant from the cell as in *thelxiope*.

Lower Madeira, July, 1913.

This form, I think, deserves a name, as it forms an interesting intermediate between the forms known as *thelxiope* and *aglaope*, Feld, occurring, too, in an intermediate region. I have seen no typical *thelxiope* from the Madeira at all, and from the Upper Madeira only typical *aglaope*.

NYMPHALINÆ.

18. *Megistanis amazonicus*, sp. nov.

♂. Very similar to *M. baeotus*, Dbl. and Hew. Differs constantly in its smaller size, the more evenly rounded anterior end of the blue band on fore wing and the narrower blue band on hind wing. Below the general ground-colour is pale green, the bulk of the black markings being suffused with greenish (brownish in *M. baeotus*); all the markings are much more sharply defined, the transverse discal pale bands wider and, especially distally, more clearly defined. There is a constant difference in the arrangement of the black markings in the hind wing cell, these being longer and narrower and tending to form long diagonal lines.

Manicoré district, Lower Madeira, June, 1913.

This species is also represented in the British Museum from R. Marmelos, Ega, Ecuador, Peru and Bolivia. It would appear to be commonly confused with *M. baeotus* in collections. It is, however, at once readily separable both from this and from *M. jupiter*, Stgr., nor can I find any intermediate. Typical *M. baeotus* is confined very largely to Colombia.

ERYCINIDÆ.

19. *Helicopis cupido* f. *nigra*, form. nov.

♂. Differs from typical *H. cupido*, L., in the entire absence of the ochreous basal suffusion in the fore wing above, and in the cell of the fore wing below.

Exact locality lost, probably Rio Purus.

(To be concluded.)

NOTES AND OBSERVATIONS.

CARATOMUS MEGACEPHALUS, Fab.—I wonder if anyone can tell me what this remarkable Chalcid, which has a head like nothing so much as the Hammer-headed Shark, is parasitic upon? It is by no means common with us, though distributed through at least Denmark and Sweden, where Thomson says it is scarce in the middle and south, and Germany, where Nees did not find it; nor does Gaulle record it from France in 1908. With us it has been known since 1833, when Walker records it as taken by Stephens in Epping Forest and by himself during July, 1827, at Ripley; the former figures it at 'Illus. Mand. Suppl.' pl. xliv, 1. But as regards its economy we have advanced no jot since the very first note in 1792, "in ligno antiquo," and Walker found it "on palings." Usually it is noticed upon window-panes, and in that situation I found it at Bentley in Suffolk on July 1st, 1903, and in this house on July 31st, 1907, but it is very rare here, and during my fifteen years' residence only one other had occurred—on a dead willow trunk, tenanted by Fossors, on Septem-

ber 21st, 1915. Singly it has been found by Piffard at Feldon in Herts and Capron at Shere in Surrey. (I have not seen Kennedy's note in 'Phil. Mag.', 1838, p. 14.) Consequently the occurrence of several together is rather an event! On June 7th, 1919, I took one here walking on the brickwork of an outhouse erected in 1892, facing west, with a stiff, warm southerly breeze sweeping across it; this was at noon. And at 5 p.m. (scientific time) a second was running on the old-painted door-post in the same wall within a foot of the first. Between the post and the wall was a crevice with a few cobwebs containing *Sialis lutaria*, etc.; on the lintel was *Corynetes caeruleus*, always common here; on the brickwork were some dozen of the spider, *Salicus scenicus*, Clerck, in various stages of growth; their numbers were remarkable, considering the dearth of insects, for single *Odynerus parietinus*, L., and *Crabro elongatus*, Lind., with several *Chrysis ignita*, L. (unusually abundant this spring), alone were seen. The following day four more, including one male, *Caratomus*, occurred in the same place and situation at 2 p.m.; I watched for half an hour or so but saw no more, and no other insects were present but the beetle *Anthocomus fasciatus*, Linn., the ichneumon, *Clistopyga incitator*, Fab., which is said (but uncertainly) to be parasitic upon both *Anobium* and *Ptilinus*; and the fly, *Medeterus muralis*, Meig. All this threw no direct light on the host of *Caratomus*, though the *Corynetes* is a known parasite of *Anobium domesticum*, and *Ptilinus pectinicornis* lives in the above willow; so considering its peculiarly buccate head, the probability lies between these two beetles and the smaller Fossors, with a leaning (as I have indicated at 'Ichn. Brit.', iii, p. 2) towards the former. If the host be hymenopterous, it will, I expect, prove to be *Diodontus minutus*, Fab., which I have since the 8th taken flying about this brick-wall as well as sitting commonly, cheek by jowl, with *Ptilinus pectinicornis* on the above willow-trunk. I do not now think that this distinctly petiolate genus has relationship with either the Cleonyminæ or Pteromalinæ, between which it is placed in my 1910 Catalogue of British Chalcididae; the petiole is very narrow, represented by only the two central lines in the capital figure of Vollenhoven's 'Schets.', pl. ix, fig. 63.—CLAUDE MORLEY; Monks' Soham House, June 12th, 1919.

DEVASTATION OF OAK TREES BY SPRING LARVÆ.—At about this time last year I wrote of the devastation of the oak trees throughout the Tilgate Forest and adjacent areas by spring larvæ ('Entomologist,' li, p. 161). This year the phenomenon has been repeated, but whereas in 1918 the area affected appeared in this neighbourhood to extend only from just south of Hayward's Heath to Horley, this year it embraces the whole breadth of the weald, from the foot of the South Downs near Hassocks to the North Downs at Merstham. Although the two attacks have much in common there are differences that should be noted. In 1918 the trees leafed early and were as a rule well covered with leaf before the attack commenced, but this year they were much later and in many cases the buds had only just commenced to expand when the larvæ devoured them, so that in such cases the trees never had the chance of showing leaf.

Again, in 1918, there was hardly a tree throughout the whole district that was not affected, but this year one may see three trees standing close together, of which two are absolutely stripped of their leaves, while the third is apparently untouched, or several trees standing together quite green while all those around them are stripped.—ROBERT ADKIN: Eastbourne, June, 1919.

A HUNT FOR *ZYGAENA ACHILLEÆ*.—My entomological friends warned me that a hunt for *Z. achilleæ* was likely to prove a wild goose-chase and to have very little chance of success. But nothing venture, nothing have. So my friend E—, on whose keenness and good eyesight I could rely, and myself determined on making the effort. The information at our disposal was certainly but very meagre. We knew that a collector named Renton was reported to have taken the insect some ten years ago in the Oban district, and that Mr. Sheldon in 1898 took a worn Zygaenid at the head of Loch Etive which he thought might prove to be of this species. But so far as we could ascertain no steamers were running this summer on Loch Etive, and so that locality had to be "ruled out" for our expedition. Eventually we fixed on a spot some twenty miles from Oban which we thought might prove likely, and there we arrived on the afternoon of June 26th. The following day we tramped a good many miles, but without seeing a sign of what we wanted. And this was hardly surprising, as neither of us had any idea whether to search the hill-tops or the lower levels—whether *achilleæ*, like *erulans*, loved the breezy heights, or, like *filipendulae*, the milder climate of the sea-level. Though unsuccessful at first we were not prepared to own ourselves beaten, and it was not long before we were out again in a fresh direction, when suddenly E— spotted a pair of "Burnets" *in cip.*, which needed only a cursory examination to cause us both to exclaim "*Achilleæ!*" Guided by this find we soon came across others, and eventually found that the insect occurred nearly everywhere in suitable spots and was certainly the common "Burnet" of this district. We found it to frequent dry and sheltered banks covered with an abundance of mixed vegetation—heath, bird's-foot trefoil, wild thyme, vetch, *Potentilla*, etc.—and I am inclined to think its chief food-plant is probably *Lotus corniculatus*. It occurred at all elevations up to 300 ft., and I have no doubt higher. Mixed with it was *Z. filipendulae*, but for each one of the latter there were at least ten of *achilleæ*. And the two species are absolutely distinct, for *filipendulae* is half as large again, is far more thickly scaled and is entirely distinct in colour, being steely blue-black, with rich rose-coloured spots and hind wings, while *achilleæ* is of a dull—almost grey—olive-green black, with pale-pink coloured spots and hind wings. And most noticeable of all, while the legs of *filipendulae* are black, those of *achilleæ* (like *erulans*) are light coloured—almost white along the inside of the tibia and tarsus. The two outside spots of *achilleæ* invariably coalesce, and there is a considerable tendency for the basal spots or dashes to run into the central pair (or one of them) of spots. We were not blessed with very fine weather, but the insect seemed to fly at almost any hour when the sun shone—preferably, it seemed to me, between eleven

and twelve and three and four (B.S.T.). As I have said, we found the insect widely spread, and I have little doubt that it occurs all over the Western Highlands and islands—wherever the surroundings are congenial to its habits.—PERCY C. REID; Feering Bury, Kelvedon.

ZYGÆNA ACHILLEÆ IN ARGYLLSHIRE.—I am pleased to report the capture of this "Burnet" in a locality about ten miles from the place where Renton found it. I had a tramp of over twenty miles before I met with the species. As the weather was rough and cold and there was no sunshine to induce them to fly, the twenty-eight that I found up to June 28th were resting on herbage. Three cocoons were secured; one of these was on heather, one on a grass-stem and the third on a post. I think that the food-plants are bird's-foot trefoil and clover.—L. G. ESSON; Kinloch-Rannoch.

LARVÆ OF PAPILIO MACHAON IN SUSSEX.—Two larvæ of *Papilio machaon* have been found feeding on carrot in the garden of a cottage in the village of Newick, in Sussex. One of the caterpillars unfortunately died but the other has been brought to me, and when I came up to London on Monday morning was starting to pupate.—H. DOUGLAS BESSEMER; Burchetts, Chailey, Sussex, July 10th, 1919.

HESPERIA MALVÆ IN CHESHIRE.—On June 1st I took two males of *Hesperia malvae* at Delamere. I believe the species has not hitherto been recorded from Delamere, or, indeed, any part of Cheshire. On the same day *Prothymnia viridaria* were also taken.—A. H. THOMPSON; 54, Church Road, Northwich.

MANDUCA ATROPOS IN CO. DURHAM.—I venture to record the capture of a male specimen of *Acherontia atropos* in this town on June 12th last. The insect was found clinging to a wall in the town by a local gentleman who brought it to the Museum for identification. It is rather badly damaged, the right hind wing being torn. Perhaps I may also mention that I had a fine specimen of *Eurois occulta* brought to me alive on August 18th. It was found on a wall near the town by a friend.—GORDON MORRISON; 31, Guildford Street, Sunderland, Durham.

CATOCALA FRAXINI.—Travelling one day early in August, 1910, on the Metropolitan Railway, near Eastcote Station, I noticed a large moth in the corner of the carriage. The only means I had of taking it was a match-box. Until I set it I thought I had caught *C. nupta* and never realised the value of my capture till some years later, as I had only just begun collecting. The band on the hind wings is of a distinct lilac-blue tinge and the fore wings are distinctly paler than *C. nupta*.—M. C. MCLEOD; The Fairfields, Cobham, Surrey.

AN UNUSUAL FORM OF APLECTA NEBULOSA.—I took at Lugan last night a brilliant green variety of what seems to me to be *Aplecta nebulosa*. Is this often found, as I do not see it mentioned in your book? The markings are similar to var. *pallida* except that the

ground-colour is this beautiful bright emerald green.—G. H. SIMPSON-HAYWARD; Leomb Place, Stow-on-the-Wold, June 28th, 1919.

SESIAS ASILIFORMIS FEEDING IN THE WOOD OF BIRCH IN COMPANY WITH S. CULICIFORMIS.—On June 15th of this year in Repton Shrubs I noticed a small birch-stump, from which several empty Sesiid pupae were protruding. I naturally supposed that these were *S. culiciformis*, and no doubt they were so, especially since I boxed on the stump a worn specimen of this moth. But on July 6th, happening to glance at this same stump in passing, I noticed a Sesiid pupa partly protruding and obviously just about to emerge. I carefully extracted the pupa, and as it lay in the palm of my hand the moth emerged with the startling instantaneous movement of its kind and proved to be a ♀ *S. asiliformis*. A brief search revealed another pupa, from which also a similar moth emerged within a few minutes. This was at two o'clock in the afternoon, but the day was overcast, and no doubt the insects would have emerged in the morning sunshine had there been any. What seems to me just as remarkable as the fact of an oak-bark feeder being found in birch is the fact that these larvae had not apparently fed in the bark, but in the solid wood. The stump had been clumsily felled and a jagged fragment of wood had been left standing at one side. This was riddled with the burrows of Sesiid larvae, and it was from cocoons placed in these burrows that the pupae were extracted. It is, I suppose, possible that the larvae had fed in the bark and had crawled into old *culiciformis* burrows to pupate. About thirty yards away was an oak stump tenanted by *asiliformis* larvae—the species is abundant in the wood—but I think it must be assumed that the larvae had fed in the stump in which the pupae were found. I should be glad to know if any case is on record of *asiliformis* feeding in birch. The pubulum certainly seems to agree with them, for the former of the two specimens is the largest I have ever seen of the species. H. C. HAYWARD; Repton, Derby, July 6th, 1919.

NOTES ON LEPIDOPTERA FROM WALES AND HEREFORD.—On Whit-Monday this year I caught at Ystrad-Feltd, Hirwain, Breconshire, a freshly emerged specimen of *Tao statice*, and in the same place *Melitaea amaria* was quite common. It was also very abundant this year at Heath Halt, three miles from Cardiff, where I think it has not been seen for a good many years, though recorded by Newman for the district. In August last year I found a specimen of the larva of *Aeronycta alni* on sloe at Torpantau, near Merthyr, which I think is a new record for Brecon. In your book on "British Butterflies" it is said that *Thecla w-album* occurs but rarely in Hereford; but in a large wooded area seven or eight miles to the north-west of Hereford this butterfly is very common—in fact, so much so that when we were camping out there the butterfly would frequently settle on our tents. T. W. RICHARDS; Cathedral School, Hereford, July 2nd, 1919.

COLOUR VARIATION OF *CACCEA CRATEGANA*, HB., IN THE NEW FOREST.—When beating the oaks during the last week of June this year I was pleased to find many specimens of *C. crategana* among

the shower of Tortrices (mainly *T. viridana*) that fell into the umbrella. A nice long series was selected representing a considerable range of variation in the ground-colour and tint of markings of the male. The former runs through shades of pale brown—ochreous to greyish—and of grey, from dark to silvery. The markings range from reddish-brown through olive brown to blackish. Specimens with blackish markings on a silvery grey ground are very attractive but I only secured three of this form. The coloration of the females, so far as the specimens I have seen are concerned, are much less variable.—RICHARD SOUTH.

ODONATA IN BRISTOL DISTRICT.—The following notes refer to dragon-flies which I have noted in this district. I have only taken one specimen of *Sympetrum striolatum*, Charp., near here, and that was on the Durdham Downs on July 15th, 1917. *Libellula depressa*, Linn., is very common everywhere, but especially at Henbury, Glos., and Cadbury Camp, Somerset. On May 24th this year I took one *Libellula quadrimaculata*, Linn., at Cadbury Camp, and saw two others but was unable to catch them. *Cordulegaster annulatus*, Latr., appears to be rather local. I have taken it fairly commonly at Hallen, Glos. *Brachytron pratense*, Müll., is exceedingly common at Cadbury Camp, but I have not taken it elsewhere. *Æschna cyanea*, Müll., is very common. I have taken it wherever there have been any dragon-flies at all. I have seen *Æschna grandis*, Linn., on the Avon near Saltford, but have not taken one there. *Calopteryx splendens*, Harr., is common on the Avon at Saltford and Keynsham. I have only taken *Agrion pulchellum*, Lind., at Cadbury Camp, but it is quite common there. It appears to be local. *Agrion puella*, Linn., and *Enallagma cyathigerum*, Charp., are very common everywhere.—T. F. HEWER; 24, West Shrubbery, Redland, Bristol.

"CO-OPERATION FOR SMALL PRODUCERS."—This booklet is one of a series of "Guides to Smallholders" intended primarily for the use of ex-service men. Nine guides have already been published and two others are in the press. They are issued gratis and post free to ex-service men and women intending to settle on the land, on application to the Board of Agriculture, 3, St. James's Square, London, S.W. 1. Copies may be obtained by the general public at the price of 2d. each, post free.

ERRATA.

Page 156, line 13 from bottom, for "Æsetoa" read "Æschna"; line 10 from bottom, for "Erallagma cyathigerum" read "Enallagma cyathigerum"; and line 8, for "cyathigerum" read "cyathigerum." Page 157, line 9, for "assulatus" read "annulatus."

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—May 22nd, 1919.—Mr. Stanley Edwards, F.L.S., President, in the Chair.—Dr. Chapman exhibited living specimens of *Trypodendron domesticum*, a beetle which burrows into the bark and wood

of oak, from Netley Heath.—Mr. Bennett, the nut weevils *Baliniinus nucum*, *B. glandium* and *B. tessellatum* from Keston, and the rare *Megatoma undata*.—Mr. Syms, living larva of *Strymon pruni*.—Mr. Ashdown, the rather scarce beetle *Ptinus sexpunctatus*, *Attagenus pellio* with supplementary spots, and two *Hylobius abietis*, showing much difference in size.—Mr. Hy. J. Turner, *Colias edusa* from Cyprns with dusky blobs at base of fore wing, and several *Pontia daplidice* from Catania and Cyprus to show the range of aberration below. Mr. Edwards, the Siricids *Sirex gigas*, *S. juvencus* and *S. noctilio*.—Messrs. R. Adkin and Mr. West, species of Lepidoptera and Coleoptera injurious to trees.—Mr. Edwards, diagrams illustrating the life-history of *Hylesinus piniperda* (Col.).—Mr. Main, lantern-slides of details of various insects destructive of timber.—Mr. B. Adkin read a paper, "Insects Injurious to Forestry." A dissection followed, especial note being made of the negligence of the authorities in allowing the huge quantities of débris of the recent felling to lie so long and thus form convenient harbour for multitudes of insect and other pests.

June 12th.—The President in the Chair.—Mr. J. A. Humphreys, of Hampstead, was elected a member.—Mr. Mera exhibited bred melanic *Hibernia defoliaria* with black females from Epping Forest from a melanic female; and living larvae of hybrid *Tephrosia biundularia* × *crepuscularia*, with larvae of the first for comparison.—Mr. West, the beetles *Anthocomus terminatus* and *Georyssus pygmaeus* from Wicken Fen.—Mr. Ashdown, the beetles *Mordellistena abdominalis* and *Tetropium gabrieli* from Box Hill.—Mr. Tatchell, a bred *Melitta crux* destitute of markings on disc of fore wings.—Mr. Bennett, a *Rhaphidia* sp. and the saw-fly of the privet.—Mr. Sperring, bred *Pararge egeria* var. *egerides* from Peterborough with a large blotch of colour in the space between the apical blotch and the next in the series.—Seasonal notes were given by the members.

June 26th.—Mr. Stanley Edwards, F.L.S., F.Z.S., President, in the Chair.—Mr. K. G. Blair exhibited living *Chrysomela distinguenda* with ova and larva on toad-flax; on behalf of Mr. Campbell Smith, *Cetonia aurata* from Berks; and on behalf of Mr. G. Wright, *Lytta vesicatoria* from Norfolk, giving particulars of the life-history of the last.—Mr. Neave, for Mr. Tatchell, a pupa of *Apatura iris* from the New Forest.—Mr. H. Main, the beetle *Necrophorus vespillo* and larva, and ova of *Melolontha vulgaris*, and gave notes on the life-histories.—Mr. Ashdown, a living *Hylophila bicolorana*, larvae of *Diaphorina mendica*, and a larva of *Drepana binaria (hamula)*, all from Surrey.—Mr. Barnard, on behalf of Mr. Coppard, larvae of *Cerura jurecula* from Limpsfield.—Mr. Step, larvae of *Gonepteryx rhamni* and cocoons of its dipterous parasite from Wisley.—Mr. Edwards, conspicuous species of exotic *Theclidae*, South American and Indian.—HY. J. TURNER, Hon. Editor of *Proceedings*.

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TWO INTERESTING INSECTS IN BURMESE AMBER.

By T. D. A. COCKERELL.

THERE are certain groups of insects of apparently primitive type, represented by comparatively few living species, scattered widely over the earth. Such forms attract the attention of all students of insect evolution, and give rise to many speculations concerning their origin and history. Two such insects are represented in a small quantity of Burmese amber, just received from Mr. R. C. J. Swinhoe, of Mandalay. The specimens will be placed in the British Museum, to which they have been presented by Mr. Swinhoe. The amber occurs in Miocene clay, and is doubtless at least a million years old. It was, however, washed into the clay from other beds, and may be very much older than Miocene.

LEPIDOPTERA.

MICROPTERYGIDÆ (Order Zeugloptera, Chapman, 1916).

Micropteryx perretus, n. sp.

Length a little over 2 mm., anterior wing about 2·3 mm.; body and appendages dark brown; wings pale brown, hyaline, without evident scaling (probably denuded); eyes very prominent, much more convex than in *Mnemonica*; maxillary palpi elongate, so far as visible similar to those of *Mnemonica*; wings very similar to those figured by Comstock's 'Manual for the Study of Insects,' p. 216, but R_{1a} runs to the costa, as in Comstock's figure of *Mnemonica* ("The Wings of Insects," p. 314); the course of the media, except the apical branches, cannot be made out. The five branches of the radius all end separately; the two analis run parallel, very close together. The frenulum, with four well-developed bristles, agrees with Tillyard's recent figures ('Proc. Linn. Soc. N.S.W.', 1918), and the humeral lobe of the hind wing is very distinct.

Burmese amber, from Mr. R. C. J. Swinhoe. This is a *Micropteryx* in the old sense : probably it falls close to or in the modern genus *Mnemonica*, but in any event it seems to present no characters suggesting an extinct genus. It is the first member of this group to be found fossil.

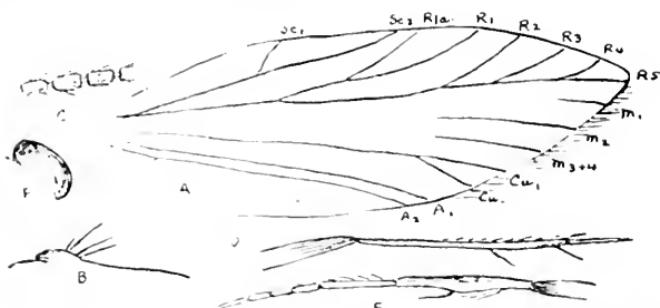


Fig. 1.—*Micropteryx porretus* Ckll. A. Anterior wing. B. Frenulum (hind wing). C. Middle joints of antenna. D. Hind leg, showing tibial spurs. E. Eye. F. Anterior leg.

ISOPTERA.

EMBIIDÆ.

Sub-family OLIGOTOMINÆ (OLIGOTOMIDÆ, Enderlein).

Burmitembia, new genus.

Males winged, related to *Oligotoma*, but with the veins all strong and conspicuous : anterior wing with subcosta short, as in *Oligotoma*, the end turned upward to costa : R_1 joining R_{2+3} , as in *Oligotoma* ;

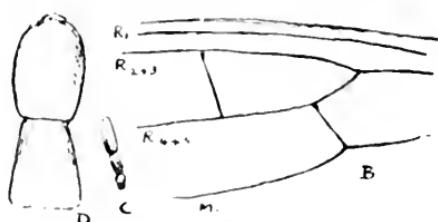


Fig. 2.—*Burmitembia venosa*. A. Part of hind wing. B. Palpus. C. Head and prothorax.

radial sector only two-branched; only one cross-vein between its upper branch and R_1 ; an imperfect cross-vein between the branches of sector; no cross-vein between sector and media; media simple, strongly arched; cubitus branched; anal simple. Hind wing with fork of radial sector much wider, the branches joined by a complete cross-vein, and a complete cross-vein from lower branch to media. Prothorax longer than in *Oligotoma*; head elongate, rather narrow. Type the following :

Burmitembia renosa, n. sp.

Male brown, about 5 mm. long; anterior wing about 4.5 mm. long; wings smoky, with dark veins. Only the middle of the hind wing is visible.

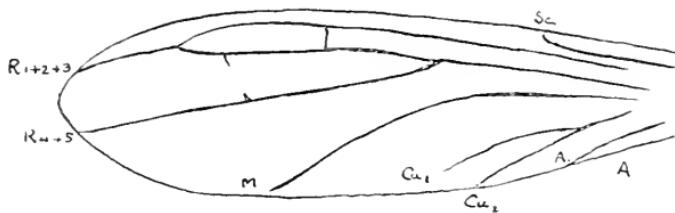


Fig. 3.—*Burmitembia renosa*. A. Anterior wing (the venation is marked).
Sc. Subcosta. R. Radius. M. Media. Cu. Cubitus. A. Anal.

Burmese amber, from Mr. R. C. J. Swinhoe. Very little is known of the extinct Embiidæ; a single species (*Embia glorissantensis*, Ckll.) has been discovered in the Miocene rocks of Florissant, Colorado, and another (*Embia antiqua*, Pictet) is from Baltic amber. There is also a species found in copal. The species in Baltic amber is represented only by a wingless male.

DESCRIPTIONS OF TWELVE NEW NYMPHALINE BUTTERFLIES.

BY ARTHUR HALL, F.E.S.

Euptoieta claudia var. *thekla*, subsp. nov.

♂ ♀. Much smaller than any of the other races of *claudia*. Upperside almost as in var. *hortensia*, Blanch., but a trifle duskier, the transverse stripe internal to the round, black post-discal spots, broader and more diffused. Underside of fore wings almost as in *hortensia*, but the apex more rufous; hind wings almost unicolorous rust-red, without any markings except a pale streak in the lower discoidal interspace beyond the end of the cell. Expands 1.25-1.5 in.

Habitat.—High plateau of Bolivia, 10,000 ft.

This dwarf race was sent out by Bang-Haas under the above name, but does not seem to have been described. With the discovery of the forms *Poasina*, Schaus, in Costa Rica, *Bogotana*, Stgr., in Colombia, and *thekla*, in Bolivia, the connection of the North American *claudia* with the race *Hortensia*, Blanch., from Chili and Argentina, which was formerly supposed to be isolated, is almost established. In *thekla* the under surface of the hind wings has a curious resemblance to that of *Argynnис anna*, Blanch., which, however, does not occur in the same district, but some hundreds of miles further south, in Chili.

Junonia larinia var. *melanina*, subsp. nov.

δ ♀. Upperside blackish-brown, without any blue gloss; all the usual red bands and markings absent except the two bars in the cell of the fore wings. The oblique discal and transverse post-discal bands of fore wings are either entirely absent or faintly indicated in greyish-brown; the anterior ocellus is small or absent, the posterior one fairly large, ringed with pale brown and with black. On the hind wings there is no trace at all of the usual pale post-discal band and the ocelli are large or very large.

Underside as in the darkest forms of *larinia*; fore wings without any red except the cell-bars, and usually without any trace of the anterior ocellus; hind wings unicolorous, the ocelli vestigial or absent.

Habitat.—Jalisco, W. Mexico, 5000 ft.

The forms of the variable *J. larinia*, Cram., have received so many names that I am reluctant to add to the number, but *melanina* is a long way the blackest of all the known forms, and, unlike some of the other "subspecies," it seems to be very constant where it occurs. I received a series of thirty specimens, of which only four are intergrades, and these are interesting from the fact that they approach more nearly to the var. *cænia*, Hübn., from the United States than to true *larinia*. Moreover, the occurrence of a highly melanic form in one of the driest parts of the whole area of distribution of the species is very unusual.

Rhinopalpa algina var. *anak*, subsp. nov.

δ . Larger than any of the other forms of *R. algina*, Bois. Upperside: Both wings with the yellow band broader than in *algina*, evenly curved on the fore wings, which have also one or two small yellow subapical spots; the outer area of both wings is paler, so that the black post-discal spots and submarginal line are more distinctly visible, and on the hind wings the posterior half of the pale stripe lying between the ocelli and the post-discal spots is yellow, like the central band.

Underside as in *algina* except that the ground-colour is a little more yellowish. Expands 3·25 in.

Habitat.—Ké and Aru Islands. Type from Ké.

This form would seem to be rare, as neither de Nicéville and Kuhn nor Fruhstorfer have recorded it.

Cybilelis mnasylus var. *meridionalis*, subsp. nov.

δ . Smaller than typical *C. mnasylus* from Colombia and Venezuela. Upperside: White spots on the fore wings larger, especially the transverse spot just beyond the cell, which is trifid and extends well below the upper median branch; on the hind wings the white spot within the pale-blue central patch is much larger and trifid, extending into the upper median interspace, and the dark red post-discal band is broader and brighter.

Underside with all the white spots enlarged as above; the rufous-brown basal patch of fore wings is much larger, extending to the submedian vein; hind wings more variegated with whitish, the zig-zag median line blackish and very prominent, the discal ocelloid spots distinct, the submarginal line also blackish and prominent.

Habitat.—Metan, N. Argentina, 2500 ft.

Dynamine isolda, sp. nov.

♂. Nearest to *D. anubis*, Hew., but differs above chiefly in the bright blue stripe along the costa of the fore wings extending around and beyond the large white subcostal spot, almost reaching the apex: the white area extends further above the median vein, and is more quadrate in shape. The hind wings have a little black at the base, and the black marginal border is broader and not marked with white.

Underside: Fore wings almost as in *anubis*, but the curved stripe within the cell is white, not yellow-brown, and only its upper edge is bordered with blue. On the hind wings there is no brown spot on the costa; the base of the wing is dark brown, edged with white; the marginal border is chocolate-brown internally and yellow-brown externally, intersected by the usual metallic blue line and internal to it by a line of white, shading to bluish near the anal angle. Expands 1·6 in.

Habitat.—Medellin, Colombia.

A rather distinct species, differing from all its allies in the blue costal stripe of the fore wings extending to the upper submarginal spot.

Eunica mygdonia var. *omoa*, subsp. nov.

♂. Slightly darker than typical *mygdonia*, the two small subapical spots on fore wings above whiter and more sharply defined.

♀. The fore wings are crossed on both surfaces by a broad quinquefid discal band of pure white, all its spots contiguous and of nearly equal size; otherwise as in *mygdonia* ♀.

Habitat.—Guatemala (Puerto Barrios, December, 1912).

In the female of typical *mygdonia* the discal band of the fore wings consists of three small and widely separated white spots, whilst in *omoa* the spots are five in number, very much larger, and not separated. The very scarce females of *Eunica* are evidently much more subject to local influences than the males, and the following subspecies show an almost exactly parallel form of variation.

Eunica cinara var. *regia*, subsp. nov.

♂. Differs from typical *cinara* from the Upper Amazon, Ecuador and Peru only in the blue of the upper surface being more brilliant and on the under surface in the pale spots below the middle of costa and at the end of the cell of hind wings being more whitish.

♀. Upperside blackish-brown: fore wings crossed by a broad white discal band formed of five contiguous spots of nearly equal size, and beyond them the usual two white subapical spots.

Underside as in the male except that the fore wings have the broad white discal band as above.

Habitat.—St. Jean du Maroni, French Guiana.

In the female of typical *cinara* the discal band of the fore wings consists of three small and widely-separated white spots, and internal to them there is a very large patch of bright blue; in *vega* the discal spots are five in number, three or four times as large as those of *cinara*, and the blue patch is either wholly absent (type), or else represented by a few diffused scales on the inner edge of the white band.

Temeris laothœ f. creta, form nov.

♂. Upperside: Fore wings dark brown, crossed beyond the cell by a broad discal band of pale fulvous extending from the costa to the inner margin near hinder angle. Hind wings dark brown, without any fulvous or tawny sealing.

Underside as in *laothœ*.

Habitat.—St. Jean du Maroni, French Guiana.

Differs from all other forms of the variable *T. laothœ*, Cram., in the fulvous colouring on the fore wings being confined to a discal band, the basal third of the wing remaining dark brown like the apex. Some of the males from the same locality belong to the form *Ariadne*, Cram., whilst others have a more or less broad black marginal border to the hind wings.

Psendaerae dolomena var. *dolibella*, subsp. nov.

♂. Upperside: Fore wings almost as in *dolomena*, but the tawny interno-basal area more reddish and slightly reduced. Hind wings crossed by a narrow band of pure white in place of the broad tawny area of *dolomena*; the rest of the wing blackish-brown, with the usual black spots and rays.

Underside as above, except that it is much paler, the discal band of fore wings yellowish and the white band of hind wings broader and less sharply defined.

Habitat.—Entebbe district of Uganda.

This very distinct form seems to be a constant local race, as I have seen several specimens from the same locality.

Psendaerae dolichiste, sp. nov.

♂. Form and pattern of *P. dolomena*, Hew., but differs chiefly in the bands of both wings being white. Upperside: Fore wings black; discal band of the same width and form as in *dolomena*, but pure white; the inner marginal patch is also white, but very small, confined to the middle of the inner margin and scarcely reaching above the submedian vein; the white-ringed black spots at the base

of the wing are placed upon a large bright-red patch, which extends to the end of the cell. Hind wings pure white, with the black marginal border narrower than in the female of *dolomena*, more sharply defined and distinctly widening posteriorly: the black spots at the base are smaller than in *dolomena* and only five in number.

Underside exactly as above, except that it is paler.

Habitat.—Usambara, East Africa.

A very interesting species, differing from all forms of *P. dolomena*, not only in its white markings, but also in the greatly reduced size of the inner marginal patch of the fore wings, which is as small as in *P. imitator*, Trim., but better defined. In the bright red patch at the base of the fore wings *dolichiste* agrees with *P. dolomena* var. *usagaræ*, Stgr., but in that subspecies the female, which alone is known, is yellow-banded, like that of typical *dolomena*.

Catagramma maimuna var. *chiriquana*, subsp. nov.

♂. Upperside: Fore wings as in *C. maimuna*, Hew., except that the red area is a little reduced, not reaching so near to the hinder angle, and that the orange subapical band is a little broader. Hind wings with a narrow red streak in the lower discoidal interspace, extending from the outer end of the discoidal cell about half way to the outer margin; faint traces of dark blue gloss round the edges of the red streak: two or three pale blue submarginal spots.

Underside as in *maimuna*, except that the red area of fore wings is reduced as above.

Habitat.—South Bolivia.

This subspecies forms a complete link between *C. maimuna*, Hew., and *C. texa*, Hew., differing from the former as described above and from the latter in the shape of the red area of the fore wings, the much narrower red streak on hind wings and the pattern of the underside. In addition to the type in my own collection I have examined three other specimens from the same district.

Palla dobelli, sp. nov.

♀. Upperside of both wings orange-fulvous, with greyish-white basal area, followed by a broad cream-coloured median band, which commences in a point on the costa of fore wings just beyond the cell, greatly increases in width to the inner margin of those wings, and is continued across the hind wings to the inner margin, the inner edge of the band being sharply defined and straight, the outer edge shading off gradually into the fulvous ground-colour. The fore wings have an irregular dark brown marginal border, widest between the costa and the upper radial and between the lower radial and upper median nervule, much narrower in the other interspaces; on the hind wings there is a post-discal series of connected dark brown lunules and a submarginal series of imperfectly separated, round, fulvous spots shading to cream-colour on their inner edge, the fourth, fifth and sixth marked

with black ocelli pupilled with violaceous (the third ocellus much the largest), and the seventh with two small lilaceous spots; margin edged with dark brown and tail tipped with whitish.

Underside almost as in *P. ussheri*, Butl., but the white median band narrower and the dark brown strike a little heavier.

Habitat.—Bitye, Ja River, Cameroons, 2000 ft.

A strikingly distinct species, nearest to the same sex of *P. ussheri*, but the basal area of both wings greyish-white instead of dark brown, the whole of the disc of the fore wings fulvous instead of this colour, being divided into a stripe along the outer edge of the median band and a submarginal series of spots, the dark brown discal area of hind wings reduced to a series of lunules in place of a broad band, and the submarginal spots of the same wings fulvous, not rufous or tawny. A second specimen, without locality, is in the Tring Museum.

SOME NEW RHOPALOCERA FROM BRAZIL COLLECTED BY E. H. W. WICKHAM, ESQ.

By N. D. RILEY.

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(Concluded from p. 186.)

20. *Mesene wickhami*, sp. nov.

♂. Both wings above bright scarlet. Fore wing with a wide even black band of about 2·5 mm. wide along hind margin and costa, and extending basally to the inner margin. Cell, with exception of very small area distally and posteriorly black; a large triangular black patch at cell-end. Hind wing with a slightly narrower even black band, a narrow oblong black mark at end of cell and basal black sharply-defined area in line with that on fore wing. Below the fore wing is uniformly black, except the inner margin, which is broadly pale yellow. Hind wing below as above.

Hyutanaian, Rio Purus, November, 1913.

One specimen also in British Museum from Ega. Also occurs at Pebas.

In the regularity of the black border this species most closely resembles *M. phareus*, Cram.

LYCENIDÆ.

21. *Thecla wickhami*, sp. nov.

♂. Fore wing above black, the basal half of cell brilliant metallic blue, the blue extending thence nearly to hind margin filling the space between vein 2 and inner margin. A circular black patch of modified scales in distal half of cell. Hind wing above brilliant metallic blue, the costa broadly black, hind margin very

narrowly black and inner margin grey. Below, both wings uniformly pale grey, fore wing with slight tinge of brownish basally: both wings have a roughened appearance. Fore wings with a transverse row of five darker outwardly paler edged long narrow spots from vein 2 upwards midway between cell-end and hind wing. This band is continued on hind wing less evenly extending to inner margin where it becomes black. In anal angle a little darker grey shading. Anal lobe black, black extending along margin and the short tail at end of vein 1. No buff or red markings of any kind.

Hyutanaian, Labrea, Rio Purus, November, 1913.

Nearest *T. leucophæus*, Hb., but easily separated by the restriction and brighter colour of the blue above, and the absence of yellow hind-wing markings below.

HESPERIDE : PYRRHOPYGINÆ.

22. *Yanguna rufescens*, sp. nov.

♂. Head brown, with a narrow white collar. Palpi white. Patagia (and probably whole of thorax) and part of abdomen above clothed with long brick-red hairs. Tip of abdomen brown, internally white. Front coxae densely clothed with long creamy hairs.

Both wings above and below dark brown with dull greenish-blue reflections. A narrow transverse band near the base of the fore wing and a large subbasal area on hind wing the same colour as the patagia. Fore wings with a broad central band consisting of three spots, the upper two oblong, the lowest triangular, situate in the cell and interspaces 2 and 1, all white and semi-transparent. On the underside this band is continued into interspaces 11 and 12 and in the latter is considerably extended basally and distally. Fringes of fore wing apically brown, becoming white towards tornus. Hind wings below as above but with subbasal red-brown area, fringes white, brick-red at anal angle, then brown towards inner margin.

Abuna, Upper Madeira, October, 1913.

Differs from *Y. aspitha*, Hew., its nearest ally, in having the thorax, etc., brick-red, not yellow, in the colour of the fringes and duller appearance. May be only a local race of this species, however.

HESPERIINÆ.

23. *Eudamus reductus*, sp. nov.

♂. Head, thorax, abdomen and legs brown. Both wings above dark brown. Fore wing finely sprinkled with yellow scales, three small transparent subapical spots arranged in a crescent, the first two spots of the central transverse band present, small, the one below in the cell reduced to a small triangular spot, the one in interspace 2 comparatively large but turned outward and pointing to costa midway between those above and the subapical spots; slightly beyond this spot, above and below, are two very small spots in interspaces 3 and 1, all translucent; fringes brown. Hind wing with a large white marginal area, its inner edge stretching from anal angle nearly to vein 4 then abruptly to the margin, fringes

white. Underside as above except for a white suffusion along whole of inner margin surmounted distally by two white marks in interspaces 1 and 2, the lower the more prominent, in fore wing; and in hind wing the extension of the marginal white area to vein 8.

Hyutahanan, Labrea, Rio Purus, November, 1913.

Separated from its nearest ally, *E. doryssus*, Swains, by the reduction and different arrangement of the transparent markings of the fore wing and the failure of the white marginal area of hind wing to reach the costa. Also from Ega in British Museum.

24. *Celenorrhinus astrigera canutama*, ssp. nov.

? Differs from typical *C. astrigera* Butl. in lacking the row of transparent spots at cell-end in the fore wing. The distal row of transparent spots is present and in the same positions except that the three anterior ones are nearly in line, which they are not in typical *astrigera*. Underside markings as above.

Allinea, Canutama, Rio Purus, October, 1913.

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ON SOME FURTHER DRAGONFLIES FROM
MACEDONIA.

BY HERBERT CAMPION.

A LIST of the Odonata taken near Salonica by Capt. James Waterston, R.A.M.C., in the second half of 1917 was published in a recent issue of the 'Entomologist' (vol. li, p. 128). In 1918 good use was made of every opportunity for making the collection more fully representative of the country, with the result that by the close of the season 335 specimens, representing 35 species, had been obtained in all. These numbers would doubtless have been exceeded, but for the fact that during a part of June and the whole of July Capt. Waterston was prevented by an attack of dysentery from collecting any dragonflies whatever.

The area explored in 1918 was of wider extent than the one traversed the year before. It included that region of Macedonia which makes the most direct appeal to the sympathies of the naturalist—that is to say, the country surrounding Stagira, the birthplace of Aristotle. At Stavros itself, as Stagira is now called, the beautiful *Calopteryx virgo* was seen flying in numbers over the very streams where the "Father of Natural History" must certainly have collected as a boy.

On October 21st Capt. Waterston enjoyed the singular experience of collecting dragonflies by moonlight. In the evening of that day *Æschna mixta*, Latr., and *Sympetrum striolatum*, Charp., had been seen flying about Janes Hill (340 metres) in some

numbers, but no captures were then made. After nightfall, however, it was quite easy—with the moonlit sky serving as a background—to detect individuals of both species resting upon the thorn-bushes (*Paliurus spina-christi*, Mill.) which occur in patches upon the higher slopes of the hill. All the specimens recorded below from Janes Hill were taken in this way with the bare hand. Both *E. mixta* and *S. striolatum* were observed to remain on the wing throughout November, although no specimens of either were seen after about the first week in December.

In England *Calopteryx virgo* seems to prefer streams with a gravelly bed, while *C. splendens* commonly frequents water flowing through a muddy channel. Capt. Waterston was invited to take note of the conditions prevailing in Macedonia, and he reported that at Stavros *C. virgo* haunts a gorge traversed by a clear, rapidly-moving stream, with no mud and few bordering aquatic plants of any kind. The stream is overhung by trees, largely Oriental planes, on the leaves of which *virgo* often rests. *C. splendens* occurred (a) along the banks of a muddy ditch with hardly any current, near Salonica; (b) by the side of a rather muddy lagoon at Stavros; (c) at the west end of Lake Beshik, the bottom of which is certainly muddy; and (d) at the stream side on lower reaches of the Rendino River, where the channel is gravelly and muddy by turns.

With the exception of *Agrion puella*, Linn., and *Sympetrum fonscolombei*, Selys, all the species taken before were met with again last summer, including *Selysióthemis nigra*, Lind. The most interesting additions were *Epallage fatime*, Charp., *Lestes macrostigma*, Eversm., *Cereion lindenii*, Selys, *Agrion scitulum*, Ramb., *Vanderia tetraphylla*, Lind., and *Gomphus fluripes*, Charp.

Mr. K. J. Morton has been good enough to examine certain material which presented special difficulty in determination, and many thanks are tendered to him for much kind assistance in this direction.

The collection is being presented to the British Museum (Natural History), which has always been singularly poor in the matter of Mediterranean Odonata.

Family CALOPTERYGIDÆ.

Subfamily EPALLAGINÆ.

Epallage fatime, Charp. — 1 ♀, Stavros, 26, v; 1 ♀, Rendino Gorge, near Stavros, 8, vi.

Subfamily CALOPTERYGINÆ.

Calopteryx virgo, Linn. — 5 ♂, 3 ♀, Stavros, 26, v. The brilliantly-coloured males have the extreme base of the wings as richly pigmented as the central area.

C. splendens, Harris—5 ♂, 4 ♀, Vardar Plain, 14. v; 1 ♂, Stavros, 23, v; 1 ♀, Lake Beshik, 1-3, vi; 2 ♂, 2 ♀, Rendino Gorge, 8, vi. In the males the extreme tips of the wings remain pale, although this pale area is smaller in extent than in British examples, but in respect of the coloration of abdominal segments 8-10 the females are indistinguishable from those taken at home. I do not consider that the race-name *xanthostomus*, Charp., should be applied to any of the specimens before me.

Family LESTIDÆ.

Lestes barbarus, Fabr.—1 ♂, 8 ♀, teneral, Vardar Plain, 14, v; 1 ♂, 2 ♀, teneral, Stavros, 23, v; 1 ♂, 1 ♀, L. Beshik, 1-3, vi; 1 ♀, Lake Adjî Geul, 18-19, vi.

L. macrostigma, Eversm.—6 ♂, 4 ♀, Stavros, 23, v; 2 ♂, 3 ♀, L. Adjî Geul, 18-19, vi. The British Museum already possesses this species from Cyprus and Albania.

Sympetrum fusca, Lind.—1 ♀, Galiko River, 18-22, iv.

Family AGRIONIDÆ.

Subfamily PLATYCNEMINÆ.

Platycnemis pennipes, Pallas—1 ♂, 3 ♀, Stavros, 23, v; 1 ♂, 1 ♀, Stavros, 26, v; 1 ♂, L. Beshik, 1-3, vi; 5 ♂, 5 ♀, Rendino Gorge, 8, vi; 2 ♀, Stavros, 8, vi. In this series the pale form with reduced spots, known as *lactea*, largely preponderates, there being only two blue males and three females of the corresponding heavily-marked form, besides another female belonging to an intermediate colour-stage.

Subfamily AGRIONINÆ.

Ichnura pumilio, Charp.—1 ♀, Galiko River, 18, iv.

I. elegans, Lind.—4 ♂, 2 ♀, Galiko R., 18-22, iv; 3 ♂, Vardar Plain, 14, v; 1 ♂, 4 ♀, Stavros, 23, v; 1 ♂, L. Beshik, 1-3, vi; 1 ♂, Lake Mavrovo, 2, vi. One of the females from Stavros carries several Hydrachnid mites on the dorsum of the second abdominal segment—a very unusual situation for such creatures.

Enallagma cyathigerum, Charp.—4 ♂, 3 ♀, L. Mavrovo, 2, vi; 4 ♂, Stavros, 7-8, vi.

Cercion lindenii, Selys—2 ♂, L. Beshik, 1-3, vi. Formerly included in *Agriomia*, in 1907 this species became the type of the new genus *Cercion*, Navás. In 1917, as a result of his study of the penis in male Agriominae, Kennedy referred to the same genus *Aarion quadrigerum*, Selys, from Japan, and other material, not determined specifically, from Japan and Madagascar.

- Agrion pulchellum*, Lind.—6 ♂, 26 ♀, Yenidje Vardar, 5, v; 1 ♂, Stavros, 23, v; 1 ♂, L. Beshik, 1-3, vi.
A. scitulum, Ramb.—1 ♂, Stavros, 23, v.
Erythromma naias, Hansem.—1 ♀, L. Beshik, 1-3, vi.
E. viridulum, Charp.—1 ♀, Stavros, 23, v.

Family ÆSCHNIDÆ.

Subfamily GOMPHINÆ.

Vanderia tetraphylla, Lind.—1 ♂, 1 ♀, Lake Ardzan, near Dragomir, 11, viii. Abundant, but hard to secure. "It settles, however, every now and then on sand or stones, and my specimens were got after a long stalk in each case" (J. W.). This is one of the most interesting of the Gomphinæ, by reason of its possessing, in both sexes, dilated margins to segment 7, as well as to segment 8.

Gomphus flavipes, Charp.—1 ♂, 1 ♀, L. Beshik, 1-3, vi; 1 ♂, Stavros, 7-8, vi.

G. vulgatissimus, Linn.—1 ♂, L. Beshik, 1-3, vi; 1 ♀, Rendino Gorge, 8, vi.

Oncynotus forcipatus, Linn.—2 ♀, L. Beshik, 1-3, vi; 2 ♂, Rendino Gorge, 8, vi.

Subfamily ÆSCHNINÆ.

Anax imperator, Leach—1 ♂, L. Adji Geul, 4, viii.

A. parthenope, Selys—2 ♀, L. Beshik, 1-3, vi; 1 ♂, 1 ♀, Rendino Gorge, 8, vi; 1 ♂, L. Adji Geul, 4, viii.

Æschna mixta, Latr.—1 ♂, Janes Hill, 21, x; 8 ♂, 1 ♀, Lower Jumeaux Ravine, near Doiran, 28, x.

Æ. isosceles, Müll.—5 ♂, 2 ♀, L. Beshik, 1-3, vi; 1 ♂, Stavros, 7-8, vi.

Family LIBELLULIDÆ.

Subfamily LIBELLULINÆ.

Orthetrum aniceps, Schneid.—2 ♂, 1 ♀, L. Beshik, 1-3, vi; 1 ♂, 1 ♀, Stavros, 7-8, vi; 2 ♂, Rendino Gorge, 8, vi. The characters of this species, as known from Macedonia, are not very constant. When compared with material from Tunis, for example, it is seen that the two males from Rendino Gorge are not typical representatives of *O. aniceps*, and a profile view of the genitalia somewhat suggests *O. cærulescens*, Fabr. At the same time, they cannot be referred to the Fabrician species, as the less bulky and more distinctly cleft anterior lamina, for instance, sufficiently shows. It seems to be advisable to regard such specimens as coming within the range of variation of *O. aniceps*, and Mr. Morton concurs in this view.

O. brunneum, Fonse.—1 ♂, adult, Yenidje Vardar, 5, v; 1 ♀, Vardar Plain, 14, v; 1 ♀, Stavros, 26, v; 3 ♂, L. Beshik, 1–3, vi; 1 ♂, Stavros, 7–8, vi; 2 ♂, 2 ♀, L. Adji Geul, 18–19, vi; 4 ♂, 4 ♀, L. Adji Geul, 4, viii. The female from Vardar Plain has the triangle in each hind wing three-celled, although the subdivision is not quite complete on the left side.

O. cancellatum, Linn.—2 ♂, 2 ♀, juv., Yenidje Vardar, 5, v; 3 ♂, 3 ♀, Stavros, 23, v; 3 ♀, L. Beshik, 1–3, vi; 1 ♂, Stavros, 7–8, vi.

Libellula quadrimaculata, Linn.—3 ♂, 4 ♀, L. Beshik, 1–3, vi. Three of the specimens (2 ♂, 1 ♀) make an approach towards var. *prænubila*, Newm., inasmuch as their wings are marked with a more or less well developed subapical brown cloud.

L. fulva, Müll.—7 ♂, 4 ♀, L. Beshik, 1–3, vi; 1 ♂, Stavros, 7–8, vi; 1 ♂, Rendino Gorge, 8, vi. The males from Lake Beshik are in different stages of development and vary somewhat in size, the length of the abdomen ranging between 24.5 and 28 mm. The subcostal space in the fore wings is free from any black streak, and very few of the wings have any apical cloud or spot. The four females, which still retain much fulvous coloration in the venation, have all the wings quite heavily tipped with brown. In four of the males from Lake Beshik and in both of those of later date the pruinosity has been rubbed away, by the legs of the female during copulation, from the sides of segment 5 of the abdomen.

L. depressa, Linn.—1 ♀, Vardar Plain, 14, v.

Crocothemis erythraea, Brulle—3 ♂, 6 ♀, Yenidje Vardar, 5, v; 1 ♂, Vardar Plain, 14, v; 2 ♂, 1 ♀, Stavros, 23, v; 2 ♂, 1 ♀, L. Beshik, 1–3, vi; 1 ♂, L. Adji Geul, 4, viii; 1 ♀, L. Ardzan, 11, viii.

Sympetrum striolatum, Charp.—1 ♂, Stavros, 7–8, vi; 3 ♂, 1 ♀, Janes Hill, 21, x; 2 ♂, Pataros Wood, 27, x; 2 ♂, 3 ♀, Lower Jumeaux Ravine, 28 x.

S. sanguineum, Müll.—1 ♀, L. Adji Geul, 4, viii.

Selysiothemis nigra, Lind.—4 ♀, L. Adji Geul, 18–19, vi; 1 ♂, L. Adji Geul, 4, viii. Abundant at this locality in June, several examples seen in or near its old haunts at Milovçi, and plentiful round the sides of Lake Ardzan, near Dragomir, during the last three weeks in August. Its white-veined wings make it easily recognisable in flight, "as does another peculiarity, viz. its preference for hawking low down over rough herbage at some distance from water." Capt. Waterston adds, "I have only once this year seen it actually flying over a water surface."

"THE HETEROPTERA OF INDO-CHINA."

By W. L. DISTANT.

Fam. REDUVIIDÆ.

(Continued from p. 149.)

Subfam. HARPACTORINÆ.

(Received from M. R. Vitalis de Salvaza.)

LIST OF SPECIES ALREADY RECEIVED.

<i>Harpactor fuscipes</i> , Fabr.	<i>Sycanus elongatulus</i> , sp. n.
" <i>marginellus</i> , Fabr.	" <i>ventralis</i> , sp. n.
" <i>flavus</i> , Dist.	" <i>versicolor</i> , Dohrn.
<i>Sphedanolestes mendicus</i> , Stål.	" <i>viduus</i> , sp. n.
" <i>flaviventris</i> ,	<i>Agriolestes ineptus</i> , Stål.
sp. n.	<i>Agriosphodrus dohrni</i> , Sign.
" <i>marginiventris</i> ,	<i>Cydnocoris fasciatus</i> , Reut.
sp. n.	<i>Phyja tricolor</i> , gen. n., sp. n.
" <i>femoralis</i> , sp. n.	<i>Endochus nigricornis</i> , Stål.
" <i>aterrimus</i> , sp. n.	" <i>atricapillus</i> , Dist.
<i>Cosmolestes annulipes</i> , Dist.	" <i>campbelli</i> , Dist.
" <i>nigrinus</i> , sp. n.	<i>Epidaus connectens</i> , sp. n.
<i>Velinus zeyanus</i> , Stål.	" <i>famulus</i> , Stål.
" <i>annulatus</i> , Dist.	<i>Astinus siamensis</i> , Dist.
" <i>lobatus</i> , Stål.	<i>Isyndus heros</i> , Fabr.
" <i>castaneus</i> , sp. n.	" <i>reticulatus</i> , Stål.
" <i>nigripes</i> , sp. n.	" <i>lativentris</i> , sp. n.
<i>Narsetes longinus</i> , Dist.	<i>Rihirbus trochantericus</i> , Stål.
<i>Sycanus villicus</i> , Stål.	<i>Panthous icarus</i> , Stål.
" <i>falleni</i> , Stål.	<i>Parapanthous spinicollis</i> ,
" <i>leucomesus</i> , Walk.	gen. nov., sp. n.

Sphedanolestes flaviventris, sp. n.

Head, antennæ, rostrum, pronotum, sternum, legs, scutellum and corium shining black; abdomen beneath ochraceous; membrane black, its apical area bronzy-brown; first joint of antennæ about as long as anterior femora; head about equal in length to that of pronotum; anterior and posterior pronotal lobes strongly centrally longitudinally excavate, the lateral angles of the posterior lobe moderately nodulose; the connexivum ochraceous and distinctly exposed; membrane considerably passing the abdominal apex.

Long, incl. membr., 14–15 mm.

Habitat.—Tonkin; Chapa.

Sphedanolestes marginiventris, sp. n.

Black, shining; first joint of rostrum, excluding base, bi-annulations to femora, subbasal annulations to tibiae and the connexivum ochraceous, the latter with large black spots both above and beneath; first joint of antennæ a little longer than anterior femora; pronotum with the anterior and posterior lobes strongly centrally longitudinally

excavate: the lateral angles of the posterior lobe somewhat prominently nodulose: apical areas of the femora distinctly subnodulose.

Long, 16 mm.

Habitat.—Tonkin: Chapa.

Sphedanolestes femoralis, sp. n.

Castaneous-brown; about anterior half of posterior pronotal lobe, upper surfaces of the femora, posterior tibiae, excluding basal areas, antennæ, apical area of rostrum, a subtriangular spot to head above behind eyes, and tegmina, excluding basal angle, shining black; basal joint of antennæ about as long as head and anterior pronotal lobe together; pronotum with both lobes centrally longitudinally impressed, the lateral angles of the posterior lobe broadly subnodulose.

Long, incl. tym., 12 mm.

Habitat.—Luang Prabang: Van Nham.

Allied to the Chinese species *S. impressicollis*, Stål, and *S. incertis*, Dist.

Sphedanolestes aterrimus, sp. n.

Black, shining; eyes dull ochraceous; first joint of antennæ about as long as head and anterior pronotal lobe together; anterior and posterior pronotal lobe strongly centrally longitudinally excavate, the lateral angles of the posterior lobe broadly subnodulose; exposed apical areas of the membrane bronzy-brown; apical areas of the femora subnodulose.

Long, incl. membr., ♂ 14 mm., ♀ 17 mm.

Habitat.—Tonkin, Chapa; Luang Prabang, Sop Choun: Annam, Keng Trap.

Cosmolestes nigrinus, sp. n.

Head above black, finely palely pilose, beneath pale ochraceous, a black longitudinal line extending from eyes to base; antennæ ochraceous; pronotum black, the margins more or less ochraceous; scutellum and tegmina black, the spatulately dilated apex of the first, stramineous; body beneath and legs stramineous, apex of rostrum, triannulations to femora—the sub-basal and apical ones most pronounced—bases and apices of tibiae, broad transverse segmental fasciae to abdomen, and lateral marginal areas to sternum, black; basal joint of antennæ about as long as anterior femora; anterior lobe of pronotum prominently globose and deeply centrally longitudinally incised; membrane distinctly passing abdominal apex; connexivum black with bright segmental ochraceous spots.

Long, incl. membr., 13 mm.

Habitat.—Laos: Vientiane.

Velinus castaneus, sp. n.

Pale castaneous, eyes biannulations to femora, tibiae, excluding basal areas, and quadrate spots to connexivum, black; membrane pale bronzy; antennæ pale castaneous, but in most specimens becoming more or less black in the two apical joints; the basal joint about as long as head and pronotum together; basal joint of rostrum not quite reaching posterior margins of eyes; apical areas

of femora nodulose; tibiae somewhat sparingly but distinctly hirsute; membrane somewhat longly passing abdominal apex.

Long., incl. membr., 12-12½ mm.

Habitat.—Laos; Luang Prabang; Tonkin.

Velinus nigripes, sp. n.

Testaceous; head, rostrum, membrane, excluding apex, and legs black; bases of femora testaceous; antennæ black or blackish; about as long as head and pronotum; basal joint of rostrum about, or almost reaching the posterior margins of the eyes; anterior lobe of the pronotum somewhat globose and centrally longitudinally incised, the lateral angles broadly rounded and inwardly incised; membrane considerably passing the abdominal apex; apical areas of femora nodulose, and with the tibiae sparingly, somewhat long hirsute.

Long., incl. membr., 10-12 mm.

Habitat.—Luang Prabang; Sop Chuon; Tonkin.—Malacca, Bukit-Besar.

Sycanus elongatus, sp. n.

Head, antennæ, anterior lobe of pronotum and scutellum black; posterior pronotal lobe, prosternum, and head beneath—more narrowly between eyes and base—ochraceous; body beneath, rostrum and legs, black; anterior coxae and trochanters, spots to intermediate and posterior coxae and trochanters, and somewhat broad transverse segmental margins, ochraceous; connexivum sanguineous, with large and broad black segmental transverse fasciæ which are more or less margined with ochraceous; basal joint of antennæ a little longer than head and anterior lobe of pronotum, the latter with a distinct central basal impression; scutellar spine very small and non-prominent; membrane prominently extending beyond abdominal apex.

Long., incl. tegm., 31 mm.

Habitat.—Tonkin; Than Moi.

Allied to *S. falleni*, Stål.

Sycanus ventralis, sp. n.

Pale sanguineous: head, antennæ, basal joint of rostrum, meso- and metasterna, legs—excluding coxae and trochanters, abdomen beneath, and large transverse spots to connexivum above, black; margins to abdominal segments beneath and to the connexival spots above, ochraceous, the lateral and apical margins sanguineous; basal joint of antennæ about as long as anterior femora; pronotum strongly centrally impressed at mid-base of anterior lobe, posterior lobe thickly finely punctate; scutellar spine distinctly erect; connexivum almost vertically erect; membrane moderately passing abdominal apex.

Long., 20 mm.

Habitat.—Tonkin; Hagiang.

Allied to *S. pyrrhomelas*, Walk.

Sycanus viduus, sp. n.

Pale bronzy-brown; head, antennæ, rostrum, scutellum, legs, body beneath, and large quadrate spots to connexivum above, black; coxae and trochanters bronzy-brown; allied to *S. versicolor*, Dohrn, but

basal joint of antennae as long as anterior femora; scutellar spine longer and more recurved.

Long, 17 mm.

Habitat.—Luang Prabang; Ban Samang; Haut Mékong; Vieng Vai.

Phyja, gen. nov.

Body elongate; head narrow, long, about as long as two-thirds of the pronotum; antennae with the first joint subequal in length to that of head, but unarmed by spine or tubercle at base; ante-ocular area longer than post-ocular, between the eyes longitudinally and broadly excavate; pronotum with the anterior lobe considerably shorter than posterior lobe and subglobose, the anterior angles tuberculately prominent, discally, centrally, longitudinally incised, lateral angles of posterior lobe subspinose; scutellum with a somewhat long, slender, apical spine; rostrum robust, first joint much shorter than second; legs long and somewhat slender, femora and tibiae almost of equal length; prosternum centrally, longitudinally incised; abdomen with a central narrow longitudinal ridge, on each side of which the lateral areas are oblique to outer margins.

This genus has somewhat the superficial appearance of *Cydnocoris*, Stål, but differs from all the genera I have placed in my Div. *Enagorasaria** by the absence of the spine or tubercle behind the antennal bases.

Phyja tricolor, sp. n.

Sanguineous; rostrum, excluding basal joint, meso- and metasterna, excluding anterior and lateral margins, legs, posterior half of membrane, antennae and eyes, black; tegmina with inner and outer claval fasciae attached to about basal half of membrane, and narrow membranal margins pale ochraceous; structural characters as in generic diagnosis, this species forming the type.

Long, 22–26 mm.

Habitat.—Tonkin: Chapa.

Epidius connectens, sp. n.

Head and first joint of antennae pale castaneous, extreme apex of the latter black (remainder mutilated), eyes black; anterior lobe of pronotum purplish-black, posterior lobe ochraceous, basal spines, both lateral and discal, black; scutellum and corium ochraceous, apex of the first black; membrane bronzy-grey; connexivum, above and beneath, ochraceous, with large quadrate sanguineous spots; abdomen beneath black, its base and sternum paler in hue; legs reddish-ochraceous; coxae black or blackish; anterior pronotal lobe obsoletely tuberculate, the anterior lateral angles prominent, posterior lobe with the lateral angles strongly straightly produced and shortly bispinous near base, the two discal spines strongly erect; connexivum obtusely, shortly, angularly prominent at the segmental angles.

Long, 24 mm.

Habitat.—Laos: Luang Prabang.

Allied to *E. latispinus*, Stål.

* "Faun. Brit. Ind. Rhynch." ii, p. 359.

Isyndus lativentris, sp. n.

♀. Dark purplish-black; body beneath thickly, finely, ochraceously pilose; corium closely mottled with dark ochraceous, membrane dark bronzy-brown; antennæ with the first and second joints black, third and fourth joints dark ochraceous, first longest, as long as anterior femora and twice as long as second, both these joints distinctly somewhat longly pilose; anterior lobe of pronotum rugulose, centrally longitudinally impressed, the lateral angles tuberculately prominent, posterior lobe about twice the length of anterior lobe, thickly coarsely punctate, the lateral angles produced, broadly angulate, their margins granulosely serrate; membrane not extending beyond abdominal apex; rostrum robust, first joint a little longer than the second; abdominal margins dilated, but narrowing anteriorly and posteriorly.

Long, 27 mm.

Habitat.—Tonkin; Chapa.

Parapanthous, gen. nov.

Head oblong, unarmed, distinctly broadest at the region of the eyes, ante-ocular much shorter than post-ocular area; antennæ with the first and second joints moderately robust, first joint shorter than the head, second joint longest; rostrum robust, first joint short, second much the longest, third short, about reaching base of head; pronotum not distinctly broader than the hemelytra, anterior lobe moderately narrowed, and armed with a curved, robust, anteriorly curved spine on each lateral angle, posterior lobe dilated and posteriorly produced over the scutellum, but centrally inwardly excavate, and thus exhibiting the apical scutellar spine; legs of moderate length, not distinctly nodulose, femora robust, the anterior and posterior most strongly thickened; anterior tibiae distinctly longer than anterior femora.

Most nearly allied to the genus *Panthous*.

Parapanthous spinicollis, sp. n.

Black, shining; head, pronotum, exposed area of scutellum, sternum, legs and spots to connexivum brownish-ochraceous; antennæ black, third and fourth joints together about equal in length to second joint; anterior tibiae ochraceous, their apices black, finely but prominently and longly hirsute; an obscure ochraceous spot near apex of corium; other structural characters as in generic diagnosis.

Long, 20 mm.

Habitat.—N. Indo-China; Muong Va.

NOTES AND OBSERVATIONS.

MEMORIAL TO THE LATE DR. F. DU CANE GODMAN, F.R.S., ETC.—The late Dr. Du Cane Godman was known personally to many readers of the 'Entomologist' as well as by his works and achievements to scientific workers at home and abroad in other branches of zoology, and botany. They will be interested to know, therefore, that a committee, with Lord Rothschild, F.R.S., as chairman, has been

formed for the purpose of placing in the Natural History Museum a bronze tablet bearing Dr. Godman's portrait, and that of his life-long friend and collaborator, Mr. Osbert Salvin. An eloquent appreciation by Lord Walsingham of the services rendered by Dr. Godman to entomological science appears in the 'Proceedings' of the Entomological Society of London for the current year—an appreciation which may be taken also as a right apologia for "the mere collector" whose labours, now as in the past, provide the material upon which the ordered progress of scientific discovery depends. Subscriptions to the memorial will be received gladly by Mr. C. E. Fagan, I.S.O., at the Natural History Museum. The balance of the monies, after defraying the cost of the medallion, will be utilised to augment the "Exploration Fund," founded in memory of her husband by Dame Alice Godman and her two daughters, with a capital sum of £5000, to be called the "Godman Memorial Exploration Fund." The primary object of this fund is for making collections for the advancement of science, and for the benefit of the Museum. It will perpetuate the memory of one of the most generous benefactors in life of the science he loved so well, while conferring a priceless boon upon the vast majority of students and research workers whose occupations and circumstances do not permit them to go out for themselves to Nature direct for the material necessary to pursue their investigations. We appeal with confidence to all entomologists to contribute their quota to both memorials according to their ability.

THE COTSWOLD ARION: CORRECTION.—Unfortunately the revised proofs of my paper (*antea*, pp. 171–178) did not reach me in time for correction, as I was away from home at the end of the month of July. Dr. T. A. Chapman very kindly draws my attention to the error on p. 175, line 15, where *Myrmica scabrinodis* should read *Acanthomyops* (= *Lastus* = *Donisthorpea*) *flava*. *A. flava*, "the ant over which we wasted so much time looking for larvae of *Arion*," he continues, "is practically the only English ant that makes hills. . . . *M. scabrinodis*," the host of *Arion*, "may be said to make hills, but they are so trifling that you never see or find them till you first find the ant." On p. 176, line 35, for *adippe* read *cydippe*, and on p. 177, line 33, for *Friornnet* read *Friornnet*.—H. R.-B.

NISONIADES TAGES IMBIBING ITS EXCRETION. The following interesting note I have received from Mr. Trevor Winkley recording his observations regarding *Nisoniades tages* excreting liquid and then imbibing it, which appears an unusual habit for a butterfly to acquire, and it will be noticed that he alludes to several examples doing likewise: "I have recently been staying near Westerham (the letter is dated June 15th, 1919) and there made some observations on the habits of *tages* that may prove of interest to you. While sitting in the garden I noticed that both *tages* and *malvae* were very fond of resting upon a rubbish-heap close by. The former also settled on various parts of my clothing; upon one occasion there were as many as five upon me. I noticed that they frequently while settled deposited a minute drop of fluid (about the size of a pin's-head) from the extremity of the abdomen and at once passed their tongues down between their legs and sucked it up." Mr. Winkley also states:

"Upon one occasion a few years ago a *tages* settled upon the back of my hand and sucked up a drop of perspiration." It is well known that various species of butterflies readily feed upon any moisture they can find, especially during hot, dry weather. I have watched several different kinds drinking at dirty puddles, the drainings from manure yards, and the liquid exuding from the droppings of cattle and dead animals, but I have not observed them drinking their own excretion.—F. W. FROHAWK.

VARIATION OF *LIMENITIS SIBYLLA* IN THE NEW FOREST.—During a visit of ten days to the New Forest last July two friends, Capt. Johnstone, his brother Douglas and myself captured fourteen varieties of *Limenitis sibylla* (no fewer than six fell to Mr. D. Johnstone's net), showing great variation from partial to almost complete obliteration of the white markings. The four which I captured exhibit an interesting graduation of variation. No. 1 has all the white markings reduced in size and those near the costa suffused with black scales. No. 2, the markings still further reduced, especially those of the secondaries, which are mostly ash-grey in colour. No. 3 has the white of the primaries still more reduced and the secondaries black with merely a faint dusting of lighter scales in the centre of the wings. No. 4 is wholly black, with the exception of a whitish spot close to the middle of the outer margin of the primaries and a faint clouding towards the inner margin of the right wing only; the secondaries are wholly black. This is var. *nigrina*. Three other specimens I obtained are equally variable: these I have set to show undersides. No. 5 is intermediate between the normal type and *nigrina*, which may be classed as *semi-nigrina*. No. 6 has the band of the right secondary obliterated, while that on the left side is fairly well developed; the primaries are as in *semi-nigrina*. No. 7 is true *nigrina* and has the secondaries (underside) handsomely rayed. Among the seven specimens are two *nigrina* and three *semi-nigrina*, Nos. 1 and 2 approaching the latter. We also captured a few *sibylla* with one or more wings partially or wholly faintly bleached. It is remarkable that this species has apparently become so variable recently. During our visit we saw about a dozen other more or less black varieties taken by different collectors. At the end of the eighties and during the nineties I visited the Forest in July for seven years and only once saw a black *sibylla*, which I was unable to secure, but during July, 1896, between two and three dozen were captured—a year I missed going there. Since then I believe it remained a rarity until last year, when several were seen and taken.—F. W. FROHAWK.

THE RE-DISCOVERY OF *ANTHROCERA ACHILLE.E* IN SCOTLAND.—I congratulate Mr. P. C. Reid on his enterprise in endeavouring to rediscover this species in Scotland, and the success which has attended his efforts (see *antea*, p. 188), but I hope he will pardon my pointing out that he has used my name in connection with the species in a sense that I think is not correct. Mr. Reid says "that Mr. Sheldon in 1898 took a worn Zygænid at the head of Loch Etive which he *thought* might prove to be of this species." So far as I am aware the only sources of information on the subject available to

Mr. Reid are two communications which I sent to the 'Entomologist's Record.' The first one, vol. xiii, pp. 136-137, was written in 1901. In this I considered my capture as "either *Z. exulans* or something new to Britain." In the other communication, vol. xx, p. 185, I say: "Mr. Tutt is quite correct in stating that the first specimen of *A. achilleae* taken in Britain was the one captured by myself and referred to in 'Natural History of British Lepidoptera,' vol. i, p. 442. I have seen the specimens obtained by Mr. Coekayne from Mr. Renton, and they are identical with the *Anthrocera* captured by me in Argyleshire on July 8th, 1898." I take it that it is this note Mr. Reid had in mind when he wrote that I "thought might prove to be of this species," and if I am correct, obviously he could not have had my statement before him when he made it. I only need say further that I have nothing to add to or omit from my note in 'Ent. Record,' vol. xx, p. 185. I entirely agree with Mr. Reid in the view he puts forward that *A. achilleae* will prove to be a widely distributed species in Western Scotland. I suppose there is no district in the British Islands that has been so little worked as the West Coast of Scotland north of the Clyde, and the adjoining islands. Largely owing to want of accommodation and difficulty of access I do not suppose 5 per cent. of the terrain has been even casually investigated. A very distinguished lepidopterist, who knows Western Scotland as well as anyone and who also knows Norway, is, or was a few years ago, confident that *Erebia ligea* is to be found there, and in view of the similarity of terrain and climate obtaining in the counties of Argyleshire and Inverness and the adjacent islands and in Western Norway, where *E. ligea* is a widely distributed species, I am inclined to think that it is very possible he may be right. At any rate, I am quite certain many surprises await the lepidopterist who will work these little-trodden regions.--W. G. SHELDON.

THE LARVA OF *INO GLOBULARIA*.—Owing to misconception contained in the text-books as to the description and habits of this larva in Great Britain, and having been informed that it had not been previously taken here, I resolved this spring to trace the larva out myself. Knowing this insect's habitat, and I may add it is exceedingly local, on May 3rd last, assisted by a fellow entomologist, Mr. C. Andrews, I visited a spot of the size of about two acres only, on the South Downs near Lewes. Getting down on our hands and knees, we commenced to search carefully amongst the tufts of grass where there was some stunted growth of black knapweed (*Centaurea nigra*). In about ten minutes a small drab-looking larva of the wood-louse shape was found, and shortly after I found two more, much larger. These had completely mimed a leaf, and I knew then that success had rewarded our efforts. After this it was no trouble to obtain several dozen. I venture to give a short description of their habits, etc., for the benefit of fellow entomologists. The ovum is pale yellow, tapering at both ends and badly shaped. Last year a female I took deposited ova on June 10th, which hatched on July 6th. These mine the leaves of the black knapweed and hibernate during the winter months, but I was not successful in rearing them. As soon as the leaves of

the food-plant appear early in the spring, the larva is about again and continues to mine the leaves until full fed. As they get bigger they move from leaf to leaf. I specially watched, with the aid of a glass, one commence the process of mining a leaf. It pressed its small, shiny, flat head on the leaf and started gnawing like a rat, and by degrees forced its way between the cuticles of the leaf until it was completely hidden as if in a bag. The colour of the full-fed larva varies, but is generally of a dingy flesh colour at the sides and yellow to dull white along the back, which to the eye appears as two zig-zag stripes. On each segment there are six flat, densely-hairy warts; this gives them a downy appearance. The rows of warts on the back are surrounded by a yellow ground, and the whole dorsal surface is covered with minute black dots. The claspers are of a light flesh colour in some, and a drab colour in others. When the leaf is picked off the larva inside invariably backs out and falls in the grass. It does not roll up, but lies in a crescent shape, but if touched or worried it contracts both extremities, forming an oval ball, the head entirely disappearing. They crawl very clumsily. I was showing some of them to a friend of mine, and even our talking appeared to annoy them, causing them to fall from the food-plant. This is hardly surprising, as they are only acquainted with the silence of the vast South Downs. When pupating it forms a tough white silken cocoon close under the surface of the ground. The pupa is of a bright yellow colour with the wing-cases of a darker shade. The imago rarely flies and is more often found crawling up the grass. The female is especially fond of settling on the yellow mullein. In windy weather they disappear altogether in the grass. I have a series of imagines taken at two different localities, and of these there are three or four distinct types. I collected over a hundred larvae between May 3rd and 20th, and these all pupated, remaining in this state from three weeks to one month. This insect seems to be free from parasites. In 'Macrolepidoptera of the World' (Seitz) Dr. K. Jordan terms the British insect *I. cognata* and not *globulariae*. Further life-history notes: Ova deposited about June 12th hatch about July 7th. Larvæ, from July 7th to 10th, hibernate when quite young, full fed May 10th to 15th. Pupæ, from three to four weeks, imagines emerging June 1st to 14th.—F. G. S. BRAMWELL; "Coniston," 1, Dyke Road, Brighton.

EUPROCTIS CHRYSORRHœA ON HIPPOPHÆ RHAMNOIDES.—Last week I was at Littlestone-on-Sea and walked over to the sandhills mentioned (*antea*, p. 169) by Mr. F. V. Theobald in his account of *Euproctis chrysorrhœa* on the Sea Buckthorn in June last. The buckthorn covers a comparatively small area of ground and is divided into three clumps, two close together and the other some thirty to fifty yards away. This last clump was the one figured in the 'Entomologist' (*antea*, p. 170); it was almost as bare as in the picture, not a solitary leaf having been left by the larvæ, but a fresh crop of young leaves was just beginning to burst forth. As far as I could see none of the larvæ had spun up their cocoons on this devastated clump but had migrated in a body for this purpose to the other clumps, which had apparently been scarcely touched by them during their feeding activities. In these two clumps the

cocoons were to be found in every direction spun up under the shelter of the leaves, sometimes with a solitary pupa, but more often in a cluster of many together. The moths could be seen from a considerable distance shining white in the sun, the females, when examined, busily engaged laying their batches of ova and covering them with the hair from their tails. As far as I could make out the females have the power of pushing out this hair as required, commencing with an end from the inside of their tails, just as one might draw the end from the inside of a ball of string, except, as I have said, it is propelled and not drawn. When a female has finished laying there is little left of the "mop" of hair at the end of her tail with which she emerged—in fact except for her antennæ she has much the appearance of the male. Very few moths were to be found anywhere except on the clumps of buckthorn, and then it was only a solitary one clinging to a blade of grass, and none of these were more than 200 yards from the buckthorn. What really interested me most was the migration of the larvae from the devastated clump to the others; it originated probably in the desire of the larvae to obtain shelter for their cocoons, although there was more in it than this, because the journey was made in one direction only and other shelters were refused on the passage. The effect of this migration, however, was to give the devastated clump a rest and chance of recovery, and further, to provide the females immediately on emergence with suitable positions for commencing their productive activities, whilst the young larvae would have abundance of vigorous leaves for their support. If this alternate cropping really takes place it accounts for this comparatively small extent of buckthorn being able to maintain such a horde of ravenous insects, as I imagine no plant could stand such attacks as that made on the devastated clump year after year.—FREDERICK GILLETT (Major); Cheriton House, Sevenoaks, August 12th, 1919.

ERGONIA POLYCHLOROS IN DEVON.—As I see from the reference-books that this butterfly is regarded as uncommon in the county, it may interest your readers to learn that a specimen (male) was captured in the drawing-room of this house by my little daughter, aged three, yesterday afternoon. It was in fairly good condition, but from its listless attitude I should say that it had probably entered the house to hibernate.—E. WHITTLEY; Park Field, Paignton, S. Devon, August 11th, 1919.

LYCENA ARION IN NORTH CORNWALL.—While staying near Boscastle, on August 11th, I took a fine specimen of *L. arion* on the heather on the top of the cliffs; a friend also took three specimens a few days previously.—ANTHONY W. M. DISNEY; 8, West Hill Road, London, S.W. 18.

DIAPHORA MENDICA IN NORTH STAFFORDSHIRE.—As this species appears to be very rare in North Staffordshire it may be of interest to say that I took two females on the moors near Oakamoor at the end of May, 1919. They were both freshly emerged and at rest on bilberry.—THOMAS SMITH; Whiston Eaves, Froghall, Staffordshire.

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ANTHROCERA ACHILLEÆ, ESPER, IN SCOTLAND. NOTES ON ITS DISTRIBUTION AND VARIATION.

BY H. ROWLAND-BROWN, M.A., F.E.S.

WITH the re-establishment of *Anthrocera achilleæ* as indigenous in the Western Highlands, it may not be out of place to review the distribution and variation of the species, and to consider its apparent isolation in this one particular region of the British Isles.

As long ago as 1881 there was published in the 'Entomologist' (vol. xiv, pp. 265-277) a highly suggestive and interesting paper by the late Dr. F. Buchanan White, entitled "Some Thoughts on the Distribution of the British Butterflies." The theories and facts put forward by the author led him to the conclusion that our butterflies in the main—and *mutatis mutandis* we may postulate the ancestral Anthrocerids—arrived with the rest of the Scottish indigenous fauna across the then dry bed of the "German Ocean" and located themselves in places where climate and food plant were favourable to their continuity.

Let us see how far the possibility of *A. achilleæ* being introduced at this geologically remote period is borne out by existing circumstances. It belongs to Hübner's group *Lycastes*,* which includes *A. exulans*, also peculiar to and isolated in the United Kingdom in one north-eastern region of Scotland, the (?) Argyllshire locality cited by Tutt† being, as now determined, that where Mr. Sheldon came across the first suspected British example of *achilleæ*.

So far *A. achilleæ* has been recorded neither from Norway nor Sweden, though *A. exulans* is widely distributed in Norway from 60° 15' to 70° 42' (Shøyen), and according to Lampa in the form *vanadis*, Dalm., from Jemtland to Lapland. It is absent from Denmark, the Netherlands, West Belgium (?) and North-West Germany.‡ That it arrived in Scotland from Scandinavia is practically certain all the same, and I agree with Mr. Sheldon

* 'Verz.,' pp. 116-118.

† 'British Lepidoptera,' vol. i, p. 453.

‡ 'Die geograph. Verbreitung der Schmette.,' Adolf, and August Speyer.

(*in litt.*) that the mere fact of its not having been turned up in these regions does not necessarily imply its non-existence there. Vast tracts of country in Western Norway remain to be explored entomologically and in Sweden, but it is certainly remarkable that we have no notice of it in the careful and usually accurate reports of those Scandinavian, British and German collectors who have visited the less northerly localities, such as, for instance, the Dovrefjeld, where it might be expected. Assuming, however, that it did follow in the wake of the northern invasion from the east—and it has been taken in Siberia—it is also surely not a little remarkable that *A. achilleæ* should not have been observed in the eastern watershed of Scotland, which, in contradistinction to the Continental countries enumerated, has been *terra cognita* to naturalists for the past century. That *A. exulans* should have escaped detection until as late as 1871, when it was taken by Mr. Traill and Dr. Buchanan White, is hardly so surprising, as subsequent exploration of the mainland has failed to locate this species elsewhere than about Braemar. Mr. B. S. Curwen, who exhibited a series at the South London Society in 1915 labelled "N. Shetlands," tells me he had them from Mr. A. E. Cannon, and has no reason to doubt the accuracy of the record. *Achilleæ* also may be turned up in some intervening localities between the east and west coasts, for even assuming Hübner's grouping of the two species in *Lycastes* to be warranted by structure, it is hardly conceivable that *achilleæ* has been evolved in this direction from the ancestral *exulans* of the Scottish mountains. It is a more likely hypothesis that the *achilleæ* of the Atlantic slope—where, as Mr. Sheldon foresees, it is likely to be found still further extended in the future—represents the western outposts of a species which once extended into and over what is now part of the British Isles from east to west. The mystery of its colonisation of the Western Highlands, then, derives no elucidation from its recorded distribution in the north of Europe.

A. achilleæ, as we know it to-day, is in fact more familiar, in relation to our islands, as a central and south European species. But, as it has not yet been detected in England or Wales, its Scots origin can hardly be attributed at present to immigrants from western France. Unfortunately I have no complete chain of evidence, even for the butterflies, of the French maritime Departments of the Channel. Such authorities as I have been able to consult suggest in Western Europe some affinity for *achilleæ* with the northward distribution of *Iphiclidæs podalirius*.

Achilleæ is recorded actually on the coast by Viret, "rather common on the cliffs of St. Valery-en-Caux," between Dieppe and Fecamp, while at the south-west extreme of the same Department it is reported from Oival in the Seine valley above Rouen.* M. Paul Noël states that it is common in this Depart-

* "Lépid. du Dept. de la Seine-Inférieure," G. Viret, Rouen, 1874.

ment, without specifying exact localities.* My friend M. L. Dupont is so exact an observer and expert of this otherwise difficult group that I have asked him for his views on the subject. He is not satisfied with some of Viret's identifications—that is clear. But he says (*in litt.*) there is nothing inherently impossible in the occurrence of *achilleæ* at St. Valery, though he has no personal knowledge. On the other hand, M. Dupont confirms the Orival locality (where it had been confused with *A. purpuralis*), which, of course, is comparatively far from the sea, observing, further, that he never found it at, or in the neighbourhood of Le Havre, where he lived for a long time. So far as Normandy is concerned, then, the nearest point to the Channel where *achilleæ* has been recently identified is near Ryes, a little town about three miles from the coast at Arromanches, Calvados. M. Dupont has seen the actual specimens taken there by M. Dumans.†

To the south of Caen it is reported on the Mts. d'Eraines, near Falaise (Calvados), by Fauvel,‡ with var. *bellidis* (a mistake for *bellis*). M. Dupont states that at the time of the publication of his paper § he had only once met with *achilleæ* in the Eure, at Deux-Amants, June 11th, 1878, in a very wasted condition. To this notice he now writes (*in litt.*): "To what I have said in my various notices you can add the hills of Gravigny, near Evreux, on the left bank of the Iton (a very good locality, where I take each year *Agriades thersites*). Here (Les Damps) I have never observed *achilleæ* except at Deux-Amants, but it is not common. It is true that I cannot visit this locality often at the time of its appearance, as my vacation has not then commenced."

As to its existence further west in Brittany on the coast or inland, M. Oberthür informs me that the soil, being schistous or granitic, *achilleæ* is absent, in contra-distinction to those parts of Normandy where it is calcareous. But, as I shall presently show, *achilleæ*, like *Agriades corydon*, does actually occur on other than calcareous formations.

Meanwhile, as far as the species under review has any immediate relationship with our other Scots Burnet *A. exulans*, I do not remember to have taken them anywhere flying together, or overlapping at the higher altitudes where *exulans* is locally common enough, just as *achilleæ* may be down to the sea level. This, of course, may be accidental. The records consulted are not very clear on the subject. Speaking generally, on the Central Alps and Pyrenees *achilleæ* ends where *exulans* begins, viz. at the tree line. All the same, it is well known that *exulans*

* 'Cat. des Lépids. de la Seine-Inférieure,' Rouen, 1894.

† 'Liste des Lépids. du Calvados,' 'Annuaire de l'Association Normande,' Caen, 1908.

‡ 'Les Lépids. du Calvados,' p. 61, Caen, 1863.

§ 'Les Zygènes de la Normandie,' 'Bull. Soc. d'Étude des Scis. Nat. d'Elbeuf,' 1899.

vanadis occurs practically at sea level in the high North at Alten (Bossekop), whence I have examples taken by Dr. Chapman at the end of June and the beginning of July, 1898. Tutt ('Ent. Record,' xvi, p. 240) mentions the two taken on the same day on the Col du Torrent in the Val d'Herens region of Switzerland, but does not specify their actual coincidence. Above Abriés, Htes.-Alpes (*op. cit.*, xii, p. 260) he found *achilleæ* only, *exulans* being entirely absent on all the higher slopes.

I note too that, though in my experience *achilleæ* in the Pyrenees haunts the foot-hills and lower elevations as a rule, and *exulans* does not begin below 1600 m. with *anthyllidis*, another member of Hubner's *Lycastes* group, certain "omnibus" localities are given by M. Rondou, for example, without information on the point at issue, viz. whether the two make contact. In the Spanish peninsula our collectors, including Mr. Sheldon, have taken it as far south as the Albarracin Sierra, and Dr. Chapman at Tragacete. In Italy it seems to reach its limit in South Latium, where, writes Conte Emilio Turati ('Lépid. Comparée,' fasc. vi), "The only locality where we have found it is at Fraine and the valley of the Petrella in the Aurunci Mountains. It flies little, preferring to remain quietly sucking the flowers. The variation of this species is limited to the extension, more or less pronounced, of the spots on the fore wings or their confluence. The majority are to be found at the end of June. We have never succeeded in finding the larva."

That *achilleæ* and *exulans* do overlap in certain alpine localities I have now incontestable authority, thanks to the kindness of Dr. J. L. Reverdin, who, with his invariable courtesy, has answered my question definitely in the affirmative. "I seem to remember having seen the two together," he writes, "but M. Rehfous"—one of the most accurate observers of Swiss Lepidoptera—"states that he saw the two species flying together at 2000 m. in a locality in the Sixt Valley, Hte.-Savoie, on July 1st, 1916, and at Findelen, near Zermatt, on July 15th, 1911.

From the southern area of the Balkans I have quite typical examples captured by Lieut. P. J. Barraud near Salonika. The Natural History Museum series includes a few from Greece from the Leech collection, the exact locality of which is not specified.

In the French, Swiss and Austrian Alps it is one of the commonest Anthrocerids, and I found a brilliant form flying over the dry grassy slopes of the mountains round Herkulesbad, which delightful entomological hunting-ground apparently falls to Rumania under the treaty of Versailles. In southern Russia the form appears to include *bella*.* Mr. Sheldon ('Entomologist,' xvii, p. 317) says all Zygaenidae were very rare at Sarepta when

* This is the form described by Staudinger as "*Major, obscurior*," but M. Dupont says the variation consists in the median upper spot of the fore wings (spot 3) being cut in two by a stout nervure.

he was there in 1914. The brothers Speyer fix the Russian northern limit at 55° lat. N. to the Urals, and Staudinger includes it in the trans-Ural regions of Siberia, which latter should be the primitive cradle of the entire race. *Achilleæ*, therefore, is rather an Anthrocerid of moderate elevations and of the plains. Of my several series—about one hundred examples in all—the highest captured are from the Dolomites of Cortina (4000–5000 ft.) and the Mendel Pass—about the same altitude, while I have it at the other extreme in the beautiful form *miniacea*, Oberthür, from Dompierre-sur-Mer, Charente-Inférieure, almost within sight of the sea at La Rochelle. It swarmed in July, 1912, on the top of the Suskului above Herkulesbad, and throughout is more abundant on limestone and chalk than on other formations. In no single instance, where I have taken it myself as above, or in other localities from which I have received it, e.g. Cannes (var. *achilleoides*), the Aurunci Mountains of central Italy, and the heights near Salonika, do the topographical conditions in the least degree suggest those of the west of Scotland. Cortina is dolomitic, but I think every other locality (except perhaps Digne) is on chalk or limestone, and that part of Digne, where it is commonest, is on the Dourbes and in those valleys where the blue clayey soil is wanting.

Indeed, its occurrence anywhere but on dry hills and the like seems unusual. The French authorities are unanimous in this respect. Dr. Macker, for example, states * in a footnote that he took numerous examples in one of the meadows of the Semwald July, 1872. "Their presence," he adds, "in the marshy meadows was no doubt due to an accidental egg-laying, for the species, ordinarily rare in Alsace, is confined to the dry chalk slopes."

It is clear, therefore, from these and my own observations, that *A. achilleæ* can exist and flourish in a variety of environment, and in view of the association of other Lepidoptera of west Scotland with the Lepidoptera of north Ireland, it would be no surprise were *achilleæ* to turn up still further west in the sister island.

The French records further suggest that *achilleæ* is double-brooded in the south and central regions at all events—e.g. Guenée reports it on dry grassy hills at Maintenon (Eure-et-Loir) in May and July, and M. Rondou's "May to July" (*op. cit.*) is to the same effect I think. Millière says definitely that there are two generations in the Alpes-Maritimes—May and July. In the east, in the Haute-Marne, where it is "always very rare," M. Frionnet found the larva on *Lotus* (? *corniculatus*) in May only, and Boisduval gives it one emergence in the environs of Paris, also in May ('*Monographe des Zygénides*').

Mr. Percy Reid, whose "Hunt for *Zygæna achilleæ*," published in the 'Entomologist' (antea, p. 188), has inspired this

* 'Catalogue des Lépids. d'Alsace,' par H. de Peyerimhoff, 2^{me} Edition Colmar, 1880, p. 47.

paper, is quite right in supposing *Lotus corniculatus* a food-plant. But it is by no means confined to it in its Continental haunts. Boisduval adds *Trifolium* and *Hippocrepis*; Donzel, *Onobrychis sativa* and *Astragalus glycyphyllos*; MM. Gelin and Lucas, *Coronilla*.

As there appears to be some doubt as to the authority upon which *A. achillae* was established as a British insect, I may be permitted to refer to two very interesting notes on the subject published in the 'Entomologists' Record' (vol. xx, pp. 73-4, 1908). The first is by Dr. E. A. Cockayne, who in the preceding year had received from Mr. Renton as Scottish *A. purpurealis* an Anthrocerid which, in his own words, "did not appear to be that species." A comparison with the series of *achillae* in the Natural History Museum led him to the ultimate conclusion that the doubtful Anthrocerid bore a strong resemblance to the ab. *riciae* of Hübner, differing from the type in the smaller size of the spots, especially the sixth, the thinner, rougher scaling of the wings, and the greater hairiness of the abdomen. His diagnosis was confirmed by the several experts to whom the examples were submitted as to the character of the markings and details of structure. Mr. Tutt's following note sums up the then described aberrations and varieties with some remarks on the distribution of the species as a whole. His conclusions, however, suggest that the species came to us from what is now western France and spread northwards, though, on M. Oberthür's authority, he was misinformed if he meant to include *achillae* in the Breton fauna.

Mr. Renton obviously had no idea of the actual identity of his captures, and Mr. Sheldon does not appear to have confirmed his suspicions—at all events in print—until ten years after his encounter with the doubtful Anthrocerid reported by him as taken in July, 1898 (*op. cit.*, p. 185). That an affinity with *A. purpurealis*, a British insect, should have suggested itself is not unnatural in view of our then knowledge of the group, and in this connection it may not be out of place again to recall a note (*op. cit.*, p. 93) by Mr. Harold Powell, of Hyères, on the interpreting of *achillae* and *purpurealis* in nature in the south of France.

As I think there is no complete published list of the forms of *A. achillae*, I venture to enumerate some of the more recently reported and named.

A re-grouping of the Anthrocerids—which the author persists in calling Zygenids, despite Kirby's (and Tutt's) claim that *Zygæna* F. should be referred to the Aretiid group, which includes *phegea*—was attempted by Clemens Dziurzynski, and published in 1909.* He divides up the several species in three

* 'Die palearktischen Arten der Gattung *Zygæna* F.' 'Ent. Zeit.,' Bd. liii (1908), Berlin. Translated in 'Proc. South London Nat. Hist. Soc.,' 1914-15.

general groups : (a) Purpuraliformes, (b) Transalpiniformes, and (c) Carnioliciformes. Without going into the scientific value of the system adopted, it may be remarked that *A. achilleæ*, outside colour and size forms, has been rather less liberally treated by modern authors in the matter of varieties and forms than most of the commoner species of the group. One trembles to think what Fruhstorfer—that progenitor of legion “sub-species”—would do with the Anthrocerids were he let loose among them.

Dziurzynski supplements the several forms admitted to varietal rank or described as aberrations by Staudinger, with the following, using the word “forma” throughout :

(i) *fulva*, Spuler.—Reddish-yellow; yellow spots sprinkled with red scales.

(ii) *brunnea*, Dz. (figured).—The typical red coffee-brown.*

(iii) *blachieri*, Dz.—Chiefly a ♀ ab., spot 3 wanting, the other spots very small.

(iv) *cingulata*, Dz.—Abdomen red-ringed.

(v) *confluens*, Dz.—Spots 1 and 3, and 2 and 4 confluent; 5 isolated.

(vi) *dziurzynskii*, Hske. (figured).—A combination of the two preceding.

The illustrations of (ii) and (vi) on Plates I and II are excellent.

Dr. Reverdin has also most kindly drawn my attention to the list of the several Swiss forms enumerated by Herr Vorbrot,† with a coloured plate of Anthrocerid aberrations conceived on the same lines as by Courvoisier on the Lycænids—one series of names for the several species of the genus, the same names being applied to corresponding aberrations of each species. The following aberrations have been met with in Switzerland according to Herr Vorbrot:

(i) *costali-elongata* (= the *cuneata* form of Tutt); (ii) *anali-elongata*; (iii) *apicali-elongata*; (iv) *basi-confluens*; (v) *costали-confluens*; (vi) *anali-confluens*; (vii) *parallela* (= *confluens*, Dz. = *dziurzynskii*, Hske.); (viii) *apicali-maculata*; and (ix) *quadri-maculata* (= *blachieri*, Dz.). In the supplement to the same work, in addition to these aberrations, we have (x) *sexmaculata*, and another, (xi) *parallela*, differing, however, from the (vii) *parallela* mentioned in the fascicule.

In this supplement also appears, as a variety, *alpestris*, Burgeff, the usual form of the Swiss Alps ‡

To the colour aberrations or forms may be added :

(i) Ab. *carnea*, de Saussure ('Bull. Soc. Lépid. Genève,' 1914,

* Reported by M. C. Oberthür from Canterets, Htes.-Pyrénées (and 'Ent. Record.' vol. xii, March, 1900, p. 80), as a form of *tristis*.

† Vorbrot and Mülder-Rütz, 'Die Schmetterlinge der Schweiz,' fasc. 3, vol. ii, 1913.

‡ 'Mitt. Münch. E. G.,' 1914, p. 47, pl. v, figs. 28–31; pl. li, figs. 154, 162.

pl. i, fig. 4), in which the normal rose-colour is "terra-cotta" throughout.

(ii) Ab. *flavescens*, Rocci ('Soc. Entom.', vol. xxix, p. 41, 1914), with the upper-side hind wings yellow, lightly sprinkled rose.

(iii) Ab. *rosa*, Rocci (*op.cit.*).—Hind wings palest rose.

M. Oberthür devotes minute attention to the species. His enumeration of the several forms in France, Switzerland and Italy ('Lepid. Comparée,' fasc. iv, pp. 461-474) may be briefly summed up as follows:

(i) *Typical*.—Paris, Doubs, Savoie, Gers, Rhone Valley.

(ii) *niniaca*, Obthr.—Charente, Charente-Infér., and Gironde; more vermillion: ♀ wings clear greenish-grey.

(iii) *tristis*, Obthr.—Spots smoother and of less brilliant colour; the insect altogether of more sombre appearance. Htes.-Pyrenees. The species does not inhabit the Eastern Pyrenees.

(iv) *alpina*, Obthr.—Ruddy-carmine fore and hind wings; frequent confluence of spots. Basses-Alpes and Isère. (Guillemot describes the forms at Larche and Barcelonette as small, but presenting many pretty variations.)

(v) = *triptolemus*, Hb.—Central Italy.

(vi) = *achilleoides*, Wagner, and *wagneri*, Millière. Alpes-Maritimes, the former reaching eastward to Bordighera, then passing into *wagneri*. This form M. Oberthür further subdivides into *subcervulea*, Millière (= *nigra*, Dz.), *giesenkingi*, Wagner, with its several variations, and *quadrinotata*, Obthr. (I have the type from the neighbourhood of Cannes kindly sent me by Mr. C. E. Morris.)

Notwithstanding M. Oberthür's diagnosis, Dr. Rocci ('Soc. Entom.', vol. xxviii, p. 56, 1913) apparently hesitates to merge *wagneri*, Mill., in *achillea*, Esp., awaiting further information and investigation before disposing his (i) var. *ligustica* definitely to one or the other. I must refer students to the original description (*op. cit.*), merely remarking that it is described as of the same size as the type with scaling and colour as *bellis*, Hb., and that in its (ii) ab. *divisa*, Rocci, by the division of the apical spot exactly in half, "we have an atavistic six-spotted form." Dr. Rocci also describes (*loc. cit.*) two more new forms from Genoa:

(ii) Ab. *pseudo-cynarae*, with the apical spot fore wings not ~~poligonata~~, but perfectly round. Underside, spots 1-2, 3-4 confluent; spot 5 separate and oblong and margin red. Form like *contractaria*.

(ii) Ab. *pseudo-wagneri*, spots on upperside as in (3), but smaller, and as to each other more distinct. Border of hind wings broader, but anal margin entirely red. Probably a transitional form to *wagneri*, which it closely resembles.

Finally we have the two new forms introduced by Dr. Verity ('B.M. Soc. Ent. Ital.', vol. xlvi, p. 72):

(i) *emirubra*, in which the apical spot is never subdivided, is always well developed, and extends to coalesce with the median anterior spot.

(ii) *elongata* (? form), described as a rare aberration, but without further particulars—here at all events.

I may add that the three “yellow” examples (= ab. *flava*, H. S.) in the Natural History Museum from Sand’s collection are very thinly scaled, and either were worn when taken, have suffered in setting, or have faded by exposure to light. Curiously enough Sand makes no mention of having discovered this form in his ‘Catalogue des Lépids. de Berry et de l’Auvergne.’ Possibly, therefore, they never came from “Central France,” as by label, at all. Of typical *achilleæ*, I think only one coloured illustration has been published in this country (Pl. I, figs. 2, 3, ‘Moths of the British Isles,’ R. South, 2nd series).

In conclusion, I should like to say that, out of consideration for space, I have reduced my translations, much to their detriment, to bare skeletons. I am also unable to bring my authorities right up to date, owing to the difficulties of providing myself with the current literature on the subject (if any there be), still held up by conditions of trade and transport on the Continent.

Mr. Reid’s series, presented to the Natural History Museum, are much nearer the typical Swiss form (= *alpestris*, Burgeff, *secut* Dr. Reverdin); in fact, they appear to me identical, except, perhaps, they run somewhat smaller and the crimson is even paler. But they are altogether larger than those I have seen from Mr. Esson, while preserving the same tendency of the lower basal and the lower median spots of the fore wings to become confluent. As Dr. Cockayne pointed out (*loc. cit.*) his Scots *achilleæ* most nearly resemble the specimens in the National Collection labelled “Bergün” (N. side of Albula Pass) from the Zeller collection. I have also a series captured by the late Mr. Tetley at St. Triphon, Vaud, in the Rhone Valley, of much the same appearance. Probably those which I have seen taken by Mr. Esson, come from a locality less favoured by climate and vegetation.

The form of West Scotland, which may be comprehensively denominated *scotica*, seems to me characteristic. The general poorness of pigment resembles that of *exulans vanadis*; in size, such as I have seen approximate to the *vanadis* of Braemar, and I have none so small, except perhaps one or two from the neighbourhood of Monnétier-les-Bains, Htes.-Alpes, taken by me in 1914. In the Scots series under review, also, the tendency to confluence (= *anali-confluens*, Vorbrodt) is decidedly pronounced. In view of the suggestive similarity of the Scots *achilleæ* to *exulans* I shall not be surprised to hear that an arctic form corresponding with *scotica* exists in Skandinavia, hitherto overlooked; and

if that prove the case, then I think we may conclude that the riddle of the presence of *achilleae* in Scotland, at all events, may be explained on the rational hypothesis of extension from across what is now the North Sea.

Harrow Weald;
September, 1919.

NEW VARIETIES OF BRITISH LEPIDOPTERA FROM CHESHIRE.

By ALFRED NEWSTEAD, F.E.S., AND S. GORDON SMITH.

Agrius convolvuli, Esp., form *venosa*, form, nov. The general ground-colour of the fore wings and fringes, respectively, is almost pure white; the costal margins, hind margins and nervures are sooty-brown, the last-named becoming paler distally and almost disappearing towards the hind margins.



1



2

Agrius convolvuli, sooty-brown, faintly speckled with white, bearing two transverse rows of white spots, with a broad white band before the nervures, and sooty-brown nervures; the outer margins and nervures being sooty-brown in the fore wings.

This remarkable and apparently unique aberration was taken at rest on a tree trunk at Delamere, May 6th, 1919 (Fig. 1).

Agrius pectoralis, Huff., form *ochrearia*, form, nov. This form closely differs from the type in the ground-colour of both fore

and hind wings, which is yellowish-buff, instead of white. The black and brown markings coincide with the type. The head and collar are deep tawny-buff. The typical white markings on the thorax, legs and antennæ are replaced in this specimen with buff.

This specimen was taken at rest on a tree trunk at Delamere, April 12th, 1919.

♂. *Crocallis elinguaria*, Linn., form *signatipennis*, form. nov. The ground-colour of the fore wings is decidedly dark buff and the cross lines which form the border to the brownish band are united together at the inner margin, forming a relatively sharp point; thus the whole outline of the transverse band, together with the large discal spot, strongly resembles the head and bill of an anserine bird. When placed with a series of typical examples, the peculiar form of the transverse band is very noticeable indeed.

Crocallis elinguaria, Linn., is, as is well known to collectors, given to slight variations in the ground-colour and the transverse lines, also in the absence of the marginal dots, but one fails to find reference to any marked variation in the shape of the transverse band.

The specimen was bred from a larva taken at Delamere; the moth emerged in July, 1918 (Fig. 2).

♂. *Nyssia zonaria*, Schiff., form *ochracea*, form. nov. The markings on the fore and hind wings are as in the type; the ground-colour, instead of being white to greyish, is a pale yellowish-buff and in this respect differs from the type.

This specimen was taken on April 20th, 1919, on Wallasey sandhills.

NOTES ON BUTTERFLIES..

By PAYMASTER-IN-CHIEF GERVASE F. MATHEW, R.N.,
F.L.S., F.E.S.

Pieris brassicæ and *P. rapæ*.—The second broods of these two butterflies were swarming from the middle of July well on into August. Sometimes the air has been literally alive with them. On hot, bright days, after the water-carts have gone round I have seen them settling in bunches on the road drinking the water and fluttering and fighting to get to the wettest parts. It was a very interesting sight.

Euchloë cardamines.—Last July the larvæ of this butterfly were not uncommon in the lanes at Instow, North Devon, feeding upon the seed-pods of the common charlock (*Sinapis arvensis*), and I took three or four dozen of them. The perfect insects emerged here during May and were set at liberty in our lanes, and whenever I released a female she attracted and became mated to a wild male in less than five minutes. I never released a female until I saw males about. The North Devon

forms are larger and more brightly coloured than our local race, so I hope that the introduction of new blood will improve the latter.

Pararge egeria var. *egerides*.—The first was seen on April 8th at Instow, and by May 7th they had become quite plentiful. On the latter date I saw two pairs *in cop.* and the females in each case were carrying the males.

Pararge meagora.—The spring brood were very abundant towards the end of May, and the second brood appeared about August 22nd in even larger numbers. When I first came to Dovercourt, in 1886, this butterfly was quite a rarity and only an occasional one was met with each season. However, a few years ago I received a large supply of ova of the first brood from the south of Ireland, and obtained more myself from Northants, and from these in the following August I bred about 200 butterflies which were "turned down" in two localities within a mile of Dovercourt. Next spring it was fairly numerous in both places and since then has spread all over the neighbourhood. I have even seen them in my garden. They are a remarkably fine type and much larger and brighter than those met with here years ago. This morning I saw a female fluttering among some dead stems of coarse grass in a hedge-row. She crawled down as far as she could towards the ground when she stopped and I could see by her action that she was egg-laying. Then, after a short rest, she struggled up, flew a few yards further on and repeated her operations.

Sciarity of Vanessids.—Up to May 8th, the day I returned here, I had noticed very few Vanessids at Instow, North Devon. A single *P. atlanta* was seen on January 23rd, single examples of *A. urticae* and *V. io* on April 8th, and several of each on 22nd and 23rd of the same month, and those were all. Here, at Dovercourt, the only Vanessid I have so far observed (August 15th) was a single worn *P. cardui* on May 11th, flying wildly about some clumps of spear-thistle. I have not seen any nests of the larva of *io* or *urticae*, although they are usually abundant, and beds of nettles this year are plentiful and luxuriant.

Adopora lineola and *Epinephile jurtina*.—On August 6th I saw a male *A. lineola* flirting and attempting amorous relations with a female *E. jurtina* as she sat on a thistle-flower. *Jurtina* did not appear to object to these attentions, but before *lineola* was able to accomplish his purpose another male arrived on the scene, a battle ensued and they all three flew away. *A. lineola* has spread all over this neighbourhood and seems to be quite abundant this season. When I first discovered it here, in 1886, it was confined to two small areas on the coast, some distance from Dovercourt, but now it may be seen almost anywhere on the sea front. On August 9th I saw one flying in the High Street; it settled on a brick wall and I had a clear view of it as I passed. *E. jurtina* is a comparative rarity here and is very local.

A PLEA FOR PIONEER WORK.

By H. ROWLAND-BROWN, M.A., F.E.S.

IN the 'Entomologist' (*antea*, p. 214) Mr. W. G. Sheldon remarks on the likely surprises awaiting the lepidopterist who will work the little-known regions of the west coast of Scotland north of the Clyde. I, too, have no doubt that the scope of his prevision might be fitly extended to many other parts of the United Kingdom. M. Dupont, writing to me *à propos* of the identification of *Anthrocera achilleae* and its recent re-discovery in the British Isles, says: "There are, then, in your islands discoveries to be made! I thought the whole of them had been thoroughly explored years ago"—a notion prevalent among most continental lepidopterists at all events. To those who know our British collectors, however, the possibilities of fresh fields of exploration are less surprising.

It is really amazing how content the majority of us are to confine our attentions to the time-honoured localities where species considered local are known to exist. The spirit of enterprise goes no further than to make sure of our captures; breaking new ground, whether at home or abroad, is left to a handful whose scientific ardour is not limited to the mere accumulation of series.

Only the other day M. Charles Oberthür raised the same question in a letter to me, from which I venture to quote: "I ask," he writes, "why English lepidopterists always come to the same mountain places in France, in the Alps and in the Pyrenees, and hitherto have always neglected the entomological exploration of the plains between the Loire and the Garonne—a rich and beautiful country." "But lepidopterists in general," he continues, "have not yet arrived at the point of view of interesting themselves with local races of species—even the common ones. In the Charentes I have discovered *Lycæna escheri helenæ*, *L. bellargus*, ♀ *cælestis*, *L. hylas* (*dorylas*), ♀ *gabrielis*, and I am a long way still from a complete knowledge of the locality; for the region is a large one, and I have explored or caused to be explored but a very small part of it."

I replied that the majority of our collectors plan their visits to alpine and other mountain health resorts with butterfly hunting as a secondary consideration, while only a few are able to make their entomology the prime and only interest.

True, we have—I think I may say it without arrogance—more amateur explorers than most countries. Their "gestes" are recorded in the pages of our scientific Transactions and magazines. But their work has been done abroad for the most part, and it seems to me that nowhere in our far-flung battle-line has an entomologist been wanting—in Egypt, in Palestine

or Mesoptamia, in the trenches and camps of France herself, and Macedonia—to observe and record such insect life as that with which he has made acquaintance on active service.

But when we come to survey the work done in the land we live in, especially as reflected in the reports and proceedings of our Natural History Societies, the results, from the exploration standpoint, are not encouraging. Men flock from year to year to the known haunts where they are sure of a big bag of—nothing new. I have been struck by the persistent repetition of exhibits at meetings, where boxes upon boxes of the same butterfly, for example, from the same place are served up for inspection, often with not even the excuse that they illustrate any particular phase of variation. Then comes the inevitable day when the locality is found to be "worked out"; when *Melita ethalia*, let us say, has been exterminated from its last woodland stronghold in such and such a county; when *Erebia ethiops* has vanished with the snows of yester-year from its accustomed patch of land. The work of extermination is complete and the destroyers wait for someone else to announce a find elsewhere. It is useless appealing to the common-sense of these gentlemen, and dealers can hardly be expected to hold their hands when a living is to be made by purveying specimens to those who either by force of circumstances are unable to travel themselves (though they have apparently plenty of money to invest with the purveyor or in the sale-rooms), or are too indolent and uninterested as naturalists to make their own captures.

Pioneer work in *terra incognita* is hardly to be expected from this section of collectors: much less from the ranks of the dealers who, quite naturally, having found a convenient spot for a rare or local species keep close their secret at least until they have effectively killed the goose who lays the golden eggs. We must look rather to those who love Nature for Nature's sake and having the means and opportunity are prepared to sacrifice a certain bag for reduced results so far as actual acquisition is concerned. I believe I am right in saying that the entomologists of our time who have added most to the common fund of our science have no collections of their own. Their captures, after study, have been placed in the Natural History or other Museums, or are distributed in the cabinets of others.

For all who can afford an entomological holiday there are at home as Mr. Sheldon, and abroad on the nearer Continent as M. Oberthur suggest, vast tracts of country virgin to the lepidopterist. How many counties are there in Britain and Ireland of which no complete and accurate list has ever been compiled, even of the one-time named Macrolepidoptera? In Scotland, north of the Clyde and Forth, there are one or two centres

where collectors congregate with the same regularity as the men who go each year to the New Forest. I should think that since the late Mr. W. de Vismes Kane died the number of active collectors in Ireland—to say nothing of English visitors—who have published their observations on the native lepidoptera might be counted on the fingers. It is hardly remarkable under the circumstances, therefore, that not until this year of Grace has *Anthrocera achilleæ* been confirmed in its habitats as an indigenous species. Lack of initiative on the part of collectors has also been supplemented in the past by a curious insularity. Indeed, it is not improbable that our latest British "Burnet" was netted long ago and, owing to the captor's ignorance of continental species, discarded as worthless from the collector's point of view, or for the same reason overlooked altogether.

Harrow Weald :
September, 1918.

NOTES AND OBSERVATIONS.

THE REARING, AND PUPATION OF *PAPILIO ALEXANOR*.—Just now and for the past three weeks larvæ of *P. alexanor* have been plentiful here with larvæ of *P. machaon* in all stages on *Pimpinella saxifraga*.^{*} A very curious fact—this plant was scarcely in evidence last year, and *ergo* no larvæ in the immediate district, at least I could find neither plants nor larvæ, and the plants were insufficient to induce the females of *P. alexanor* to lay thereon. This often happens with *Galactites tomentosa* at Cannes—a kind of thistle which come in crowds about every two years, and is very sparse in between. *P. alexanor* is a great trouble when pupating, and disturbs those already *in situ* to do so. It is impossible to place many together. As it is so conspicuous I could not have overlooked it last year although the imagines were not rare. A great many are ichneumoned, which pest appears to kill off the larvæ during the third instar. I have captured two kinds of ichneumons at work on them and many pupæ. I expect to have about 50 sound pupæ, and could take 150 if I knew where to rear them.—C. E. MORRIS: St. Etienne-de-Tinée, Alpes Maritimes, August 20th, 1918.

Mr. Morris's note on the local exclusiveness of *P. alexanor* and its food-plant at St. Etienne is interesting, and the food-plant is

* Mr. Morris tells me (*in litt.*) that this plant was identified by two expert botanists staying at St. Etienne this season. The disassociation of *P. alexanor* from *Seseli montanum* is, I think, unusual in the Basses-Alpes and Alpes-Maritimes. Tutt, probably speaking from his experiences of the species at Digne ('British Butterflies,' vol. iii, p. 35), says that it is restricted to *S. montanum*, "and appears to attack no other plant." He does not seem to have been aware, however, that in Rippert's original description the food plant is given as *S. dioica* (*sic*), while Millière reports that the larvæ were abundant on several species of Umbelliferæ, though he did not collect them, at Celles-les-Bains, Ardèche ('Icon. Chen. Lépid., t. i, p. 167; nov. sér. t. v. 1859). Incidentally, this is the only reliable notice I have of the regular occurrence of *alexanor* west of the Rhone. (H. R.-B.)

new to me at all events. I, and many others who have collected, e.g., in the Basses-Alpes in the neighbourhood of Digne in bygone years, have been not a little puzzled to find the larvæ and imagines apparently quite absent from the haunts where we found them, it may be, the previous season. Curò gives both *Seseli dioicum* and *S. montanum*: Mr. Bromilow adds "and other alpine Umbelliferæ." So far as I know, larvæ transported to England and placed on carrot have failed to mature. Mr. B. C. S. Warren and I collected and brought home a number in 1910, but we were not successful in rearing a single individual. Of our garden *Seseli*, I note *S. diehottum* is stated to be perennial, *S. gummiferum* biennial, while *S. tomentosa*—partly (?) biennial at Cannes—is returned in Johnson's 'Gardener's Dictionary,' as a hardy annual when grown in this country. M. Fronnet, in his "Les Premiers États des Lépids. Français," makes no mention of the parasites preying on *P. alexanor* larvæ. He also states that the hibernating pupa is "usually attached to rocks," following Mr. F. Bromilow ('Butterflies of the Riviera,' p. 6). The few pupæ I have had in my possession suggest having been attached to the food-plant, though I cannot be sure, as they had been isolated when I received them. The other Papilio's of this group, *machaon* and *hospiton*, are in nature usually attached by silk thread to stems or twigs. With this in mind, I wrote again for further information on the subject of the food-plant and method of pupation to Mr. Morris, who has kindly supplied the following information in answer to my inquiries.—H. ROWLAND-BROWN.

"Here and there are still young larvæ of *Papilio alexanor* feeding with those almost full fed, and it is evident that these late young ones will feed up very badly as the plants run to seed and dry up very rapidly, and, from what I can see, will have done so before the late larvæ can arrive at maturity to pupate. This, no doubt, is the reason of the extreme small size of some of the imagines met with. We took one example of no larger than two inches' expanse from tip to tip of its somewhat unusually elongated wings, the hind wings being very small. With regard to the pupation of the larvæ, I can only tell you that in confinement they almost all seek to pupate on the roof—i.e. horizontally. Very few—only four—have taken up a perpendicular position on the sides of the cage. In nature we can nowhere find the pupa, but seeing that the food-plants grow among stones and boulders in dry ravines or rocky banks, I am inclined to agree that they pupate on rocks, and probably under ledges under stones piled on others or forming small caverns, as it were, and herein they get warmth from the sun-heat on the stones (which are always like hot lead) now and moisture coming up from the 'wet earth' from the melting snows and spring rains, giving them the necessary warm vapour in which to emerge at the due season. And again, the wonderful form, hardness and coloration of the pupa all lead one to suppose that its site of pupation is on rocks, where it is evident it would be so well disguised as to protect it from reptiles, to which I have no doubt a certain number fall victims both before and during pupation as well as ichneumon guests. I wish I could give you more certain information. I am convinced, however, that the form

of the pupa and the necessary width between the ends of the silken band attaching it to the wood of the cage preclude any idea of it attaching itself to the stems of the food-plant, which are extremely fine and wiry. Another fact: I find that its silken attachments to wood are very easily detached—*i.e.* the gummy silk does not stick well to wood. On the other hand, two larvæ which escaped and pupated on the cement wall of our rooms were far less easy to detach from the wall than from the cage. There may or may not be something in this. I give it you for what it is worth.—C. E. MORRIS; St. Etienne-de-Tinée, September 1st, 1919."

HISTORICAL NOTE: NICHOLAS GWYN.—When he was collecting insects about Ipswich some years ago Dr. Philip Brookes Mason told me he contemplated the compilation of a chatty book on entomological personalities, and I was much disappointed to hear, while on a visit to Burton in 1901, that he had abandoned the task as too arduous. But some day (when much of the most valuable material is irretrievably lost) a chronicler will arise and give us a word-picture worthy of the Victorian and earlier pioneers of our science. Meanwhile the Editor of the 'Entomologist' will heartily welcome exclusive information upon this subject, which has never yet received the attention it deserves—*e.g.* how slightly was Mr. Sheldon able to associate Henry Tibbats Stainton, F.R.S., with his favourite hunting-ground at Mickleham in 'Entom. Record,' 1919, p. 31. And Stainton did not die till December 2nd, 1892. There is, then, small wonder that the pronominal of *Andrena gwynana* should nowadays be utterly forgotten amongst us. This bee was so named by William Kirby in 'Monographia Apum,' 1802, ii, p. 120: "Memoriae botanici periti, tum et naturae scrutatoris indefessi, mihi et omnibus Historiae Naturalis cultoribus semper amicissimum se praebentis, Nicolai Gwyn, M.D. Gippovicensis, hoc insectum dicatum volo." It is, however, remarkable that he is not referred to among Coyte and other Suffolk entomologists at p. xvi of the preface of this work. Nicholas Gwyn was a good all-round naturalist for his time and is noticed as such in my 'Hymenoptera of Suffolk,' p. 13. We knew he practised in Ipswich and that he died there in 1798, but I have only just discovered exactly where he lived. In the 'Gentleman's Magazine,' 1796, part ii, p. 913, is a note on the erstwhile mansion of Sir Anthony Wingfield, executor to King Henry VIII, in that town, wherein we are told that "part of the building has served as a play-house, and the family chapel opposite thereto is succeeded by Dr. Gwynne's house." That is to say that the mansion was on the north side of Tacket Street, and the chapel, upon the site whereof the doctor then lived, was on the south side of the same street, almost or quite at the corner of the present Wingfield Street, which branches out of it. Though *Andrena gwynana* has stood in the British list for over a century, the strict prioritists are beginning to threaten its perpetuity (*cf.* 'Ent. Mo. Mag.', 1919, p. 10, *nota*) as possibly synonymous with *A. bicolor*, Fab. We trust the change will be averted.—CLAUDE MORLEY.

STILPNID ICHNEUMONS.—In continuation of my recent note upon this interesting subject, it were well to record that I have received for

determination from Dr. Graham-Smith two females of *Atractodes exilis*, Hdl., bred from puparia of *Oncisa cognata*, Mg. (bluebottle-fly), the larvae of which were found to be parasitic on certain snails; the account of this will appear in 'Parasitology,' by D. Keilin. One male of *L. croceus*, Hdl., bred from a puparium of the Anthomyiid Dipteron *Hypotachus dentipes*, Fab. One female of *Atractodes tenebrosa*, Gray, also bred from *H. dentipes*; the account of these will appear in the 'Journal of Hygiene' by J. E. M. Mellor. The Stilpnidae is an obscure group, and one which has not been adequately worked out since the appearance of Haliday's paper in the 'Annals and Mag. Nat. Hist.' of 1839. Arnold Förster greatly complicated their study by a ridiculously elaborate "Synoptische Uebersicht der Göttingen und Arten in der Familie der Stilpnoiden" ('Verh. Wien. Akad. Ges.' 1876), and but little good work has since appeared on the group.—CLAUDE MORLEY.

VARIATION IN *CHRYSOPLANUS PHLEAS*, *ARICIA MEDON*, AND *NISONIADES TAGES*.—The following variations of *C. phleas* observed by me in the past two seasons may be of interest: (1) 22 mm. in breadth when ordinarily set; each wing $8\frac{1}{2}$ mm. from base to apex. Pale straw-yellow replacing the normal copper. Approaches ab. *cuprinus*, Tutt, in this respect; the brown rather washed out. Appears to be a combination of ab. *minor*, Tutt, and ab. *cuprinus* = ab. *minor-cuprinus* (Burnham Beeches, August 10th, 1918). (2) A slightly larger specimen, approaching ab. *intermedia*, Tutt (Mortimer Common, August 21st, 1918). (3) ab. *intermedia* (same date and locality). (4) ab. *intermedia*, but with distinct tails = ab. *intermedia-cantata* (Weston-in-Jordans, August 11th, 1919). (5) ab. *cuprinus* very pale *trs. ad alba*, Tutt (Mortimer, August 21st, 1919). I think (1) must be unusually small, and Tutt says that (4) is unusual in England. At Clevedon, Somerset, I have taken this year three rather odd forms of *Aricia medon*: (1) Probably teratological, 21 mm. Right posterior wing well marked, but much reduced in size; from the base to the farthest point in the outer margin barely 5 mm. (2) 18 mm. in expanse; might be called ab. *minor*. (3) Approaching var. *actinerea*, the black discoidal spots on the wings being distinctly surrounded with white. (This rather suggests to me ab. *affinis data*, Harrison.)—H. R. B. I also took a somewhat remarkable pathological example of *Nisoniades tages* at Bradfield, Berks, which was dull yellow all over, shading in places with brown scales.

JAMES E. BLACKIE, The Vicarage, Windsor, Berks, September 8th, 1919.

ATTacus PROMETHEUS IN ENGLAND.—You may like to hear of the extra-ordinary occurrence of *Attacus prometheus* at Ditton Park on April 19th, 1918. The specimen is in my collection, and its appearance — to be explained, I suppose, by importation of the pupa among plants.—JAMES E. BLACKIE, The Vicarage, Windsor, Berks, September 8th, 1919.

As there were practically no imports of plants during 1916-18 the appearance seems to me due to an escape, possibly from a breeding-cage, the successive generations of *A. prometheus* have been propagated.—H. R. B.

COLIAS EDUSA IN HAMPSHIRE.—A passing example was seen on August 21st last between Romsey and Cadnam, Hants.—L. C. E. BALCOMB; Kingston-on-Thames.

COLIAS EDUSA NEAR ABERDEEN.—A fine male specimen of this erratic insect was captured by me at Burnbanks, Kincardineshire, on August 3rd this year. It was flying with *Pieris napi*. I secured it in one of the gulleys facing the sea as it alighted on *Trifolium medium*. *Colias edusa* had been previously recorded in the 'Entomologist' (vol. xxii, p. 279) as taken at Denmore near Aberdeen, which is more inland. It is interesting on account of its capture so far north.—JAMES DUNCAN : 13, Northfield Place, Aberdeen.

COLIAS EDUSA IN ESSEX.—Yesterday, when travelling home from London, I saw two *C. edusa* flying on the railway-bank—one near Ingatestone, the other near Hatfield Peverel.—PERCY C. REID; Feering Bury, Kelvedon, September 5th.

COLIAS EDUSA AND C. HYALE NEAR Maldon.—On September 5th I saw about a dozen *C. edusa* flying in a lucerne field near here, apparently all males. The strong wind and great heat made it a difficult matter to chase them successfully, and I failed to secure more than three. I also saw two *C. hyale*, one of which I caught. This latter species I haven't seen here since August, 1902.—(Rev.) GILBERT H. RAYNOR; Haysleigh Rectory, Maldon, September 16th, 1919.

COLIAS EDUSA IN SURREY.—I took a nice male *Colias edusa* yesterday afternoon flying across our lawn. This is the second specimen I have seen in our garden this year. The insect was in perfect condition, and rather larger than any previous male I have taken, measuring 5·8 cm. across the wings.—M. C. MCLEOD; The Fairfields, Cobham, Surrey, September 20th, 1919.

VARIATION OF DRYAS PAPHIA.—During the past two seasons *Dryas paphia* has been subject to variation to a very remarkable degree in the New Forest, which is of such unusual occurrence that it is of some interest to place on record the capture of some of the more marked aberrant types which have taken place this year. But an almost similar phenomenon occurred thirty-eight years ago—*i.e.* in 1881—respecting this species in the New Forest, although since that date until last year aberrations were but seldom met with; so scarce were they that during seven successive years when I visited the Forest from 1888 onwards, as well as three or four subsequent visits, I did not capture a single striking variety, excepting the white-spotted forms, which were tolerably plentiful in the early nineties, as well as the var. *valezina*, which was especially numerous in 1893. Last July, during my ten days' collecting, I found *paphia* fairly abundant, but nothing like the numbers that swarmed thirty years ago, and, according to reports, very much less in number than last year. Notwithstanding this comparative scarcity aberrations occurred in unusual quantity. Among the finest examples I captured are two exceptionally beautiful females, almost similar in pattern and depth of markings, having the greater portion of the wings richly clouded with black due to confluence of the markings, while the basal

area is of the normal colouring, on the under side the black markings on the primaries are likewise confluent, producing a large central blotch; the secondaries have the basal portion clouded with silver, the median area green and a broad marginal silvery band. One of these I took on July 15th; the other on the following day within 100 yards of the spot. I saw others captured more or less similar in pattern. A large number of examples were captured having the sub-marginal spots confluent, forming a series of elongated markings on both primaries and secondaries of similar variation to the specimen I described, and figured in the 'Entomologist' for April, 1900. One of the series I captured is a particularly handsome female very like the one figured, but all the markings bolder and the sub-apical blotch more intensified. This beautiful insect I also captured on July 15th, a few minutes after taking the fine melanic specimen described above. They are both the finest examples of these types of variation I have seen. I found the white-spotted varieties scarce, but var. *valezina* was comparatively common. I saw a beautiful melanic var. of *valezina*, but was unable to secure it; during its flight it appeared of the deepest velvety-black. I also saw a dark-clouded specimen which was out of reach, and another almost similar, but smaller, which was captured by another collector. This rare varietal form of *valezina* also occurred last year.—F. W. FROhawk; September, 1919.

ABERRATIONS OF ARGYNNIS AGLAIA, BRENTIS EUPHROSyne AND *B. selene* AT BRIGHTON.—I was on the Downs near Brighton on June 8th last when I saw scores of the larva of *A. aglaia* racing over the grass. I rather think they were searching for food, as the growth of the turf and dog violet was very stunted at the time owing to drought during the previous six weeks. The morning was hot and sunny. I bred out a nice series, some very dark and one silvery form. Dark varieties of *B. euphrosyne* and also *B. selene* have been taken this year.—F. G. S. BRAMWELL; 1, Dyke Road Drive, Brighton.

ZELIHYRS QUERCUS, VAR. *BELLUS*.—It may interest readers of the 'Entomologist' to know that a specimen of this rare variety has been taken within two or three miles of my house by my son. It is unfortunately worn, being captured almost accidentally so late as August 21st. The specimen has been fully verified, and appears referable to Tutt's sub-variety *bellus obsoletus*, there being only one orange blotch on each fore wing. The insect is small in size, and is, of course, a female.—HAROLD D. FORD; Thursby Vicarage, Carlisle.

PAPilio MACHAON IN SUSSEX.—On June 13th, much to my surprise, I found four larva of *P. machaon* on carrot in a garden close to Heathfield. Three were full grown and one in the second skin. The small one died, but I bred the other three out on August 9th. I find they are most certainly lighter and brighter in colour than Wicken specimens, of which I bred hundreds when residing in Cambridge. Four more larva were taken at Ticehurst, which is about nine miles from here.—E. CRISP; Heathcote, Heathfield, Sussex.

LIMENitis SHYLLA, LINN., AT BURNHAM BEECHES.—It is now possible to supplement the record published in 1918 ('Entom.',

vol. li, p. 93), for on July 24th last I saw at least one specimen of the White Admiral, apparently in fine condition, flying over one of the less frequented drives through the Beeches. As the butterfly repeatedly came within easy range of observation I was able to satisfy myself about the identification and consequently did not attempt to make a capture. It would seem to be the case that *L. sibylla* has re-established itself securely in one district of Buckinghamshire at all events, after an apparent absence of about a century.—HERBERT CAMPION; 58, Ranelagh Road, Ealing, September 1st, 1919.

LIMENITIS SIBYLLA IN BUCKS.—On July 15th last I captured a specimen of *L. sibylla* near High Wycombe. I have been collecting in this district for many years, but had never met this butterfly before.—WALTER PIERCE (Lieut.); High Wycombe, Bucks.

POLYГОNIA C-ALBUM.—On July 30th my nephew took a freshly-emerged specimen of *P. c-album* near Winchester. I believe that this butterfly has not been taken in the Winchester district for some years.—WALTER PIERCE (Lieut.); High Wycombe, Bucks.

ARGYNNIDS IN DORSETSHIRE.—Rather exceptionally (as it appears to me) to the usual rule with insects this year, the three large species of fritillary seem to have been more common than usual here. I noted a specimen of the var. *valezina* of *D. paphia* in woods between Wool and East Lulworth two or three weeks ago. I had not seen it here before.—F. H. HAINES; Winfrith, Dorset, August 30th, 1919.

AGRIADES CORYDON IN THE NEW FOREST.—On August 26th last I was much surprised at capturing a male Chalk-hill Blue Butterfly in the New Forest. It was flying over heather in flower by the side of Highland Water a quarter of a mile or so above Queen's Bower. Of course, any chalk or limestone was miles away.—W. J. LUCAS; Kingston-on-Thames.

PARARGE MEGERA, LINN.—In the district with Brockenhurst as centre I have found this butterfly very common of late. It is, I believe, considered not at all a plentiful insect—at any rate in the part of the Forest near Brockenhurst. Its congener, *P. egeria* var. *egerides*, is as common as usual.—W. J. LUCAS; Kingston-on-Thames.

SPHINX CONVOLVULI AT PUTNEY.—A male specimen of *S. convolvuli* was brought to me by Mr. Reginald Urquhart on September 7th. He stated that the moth came to light in his dining-room at Hurlingham Court, S.W. 6. It may be added that the window of the dining-room overlooks the river.—RICHARD SOUTH.

CHEROCAMPA NERII AT DOVERCOURT.—This afternoon Dr. F. H. Cook of this place called to ask me if I would look at a few butterflies which his boys had recently captured and tell them their names, etc. Of course I said I should be delighted to do what I could, and the boys, who had accompanied their father, then opened a large cardboard box they had brought with them, when, to my astonishment, there, impaled on a pin with a large black glass head, was a female *nerii*! It was set in a groove formed by fixing two strips of thick cork carpet to the bottom of the box, its wings had been stretched

out and seemed with paper, and it was not at all badly set. It was discovered by Mr. Basil W. Cook, the eldest boy, who found it the day before yesterday in their garden as it was resting on the leaves of a small branch that had recently been lopped off a sycamore tree. Unfortunately it had been killed with ammonia, which had destroyed the beautiful green colour and changed it to a pinkish-brown, but otherwise it is a fair specimen. As the moth was still in a limp, relaxed condition, I was able to re-pin and re-set it on a proper setting board, and I think it will make a decent specimen when it is taken off. These boys have only just started collecting. It is extraordinary what luck beginners have. One of my first captures, when I was a small boy in September, 1855, was *Sphinx convolvuli* flying before honeysuckle, and at that time considered a rare species.—GURVASHI F. MYRIEWS : Dovereourt, September 4th, 1919.

ILLUSTRATIONS OF COCCINELLA 7-PUNCTULÆ.—This beetle has been more abundant than usual here this summer. Amongst them I have noticed one specimen each of two well-marked varieties. In the first case the posterior spot on each elytron was missing, leaving five spots, of which the two anterior were reduced in size. In the second example these had also entirely disappeared, so that in addition to the central black mark there was only one well-marked spot in the centre of each elytron. I am not sufficiently acquainted with the variations of this species to know if these observations are worth recording.—E. WHITLEY : Park Field, Paignton, S. Devon.

VISIT TO CRABRO.—Hornets seem very common in the New Forest this summer (1919). The lepidopterist's sugar is much frequented. In the day-time, at least, the insects come for the sugar itself. It may be that at night such delicacies as *Thyatira derasa* or *T. batis* constitute as great an attraction for them as for the sugarer!—W. J. LUCAS.

ORTHOPTERA IN DORSETSHIRE.—The Orthoptera of this neighbourhood (Wareham district) appear to present no feature of outstanding interest, but the following records as a local list may throw light on distribution. The non-occurrence of species may be as significant and interesting as their greater or less plenty. *Labia minor*, Linn., and *Ficimia strigulata*, Linn., are our only Forficulidae. Of the Blattidae, *Ectobius panzeri*, Steph., and *E. perspicillaris*, Herbst., are common on heath and rough places by the coast. *Blatta orientalis*, Linn., is abundant as usual in houses. Gryllodea: The fine cricket, *Gryllus campestris*, Linn., has been found in potato plots in the vicinity, not been disturbed, when hibernating in manure for the sake of warmth in autumn, in our garden. *Gryllus domesticus*, Linn., is less common than formerly, and its chirp has ceased by our kitchen fire where it used to sing. Grasshoppers are extremely scarce in individuals. Locustodea: *Leptophyes punctatissima*, Boie, is frequent in bushy places, and *Conocephalus dorsalis*, Latr., occurs at Arne and Broadworf. *Pholidoptera viridissima*, Linn., is plenty along the coast among nettles and rough vegetation, extending a mile or two inland in suitable localities on the downs. I have not seen a specimen taken as far from the coast as Lower

Rockhampton. *Pholidoptera griseoaptera*, De Geer, is frequent in brushwood, as is *Metrioptera albopunctata*, Goeze, on the coast, in uncultivated places, whether chalky or heathy. *Metrioptera brachyptera*, Linu., is common on pastures, heaths, and in open woodland spots. Acridioidea: *Gomphocerus rufus*, Linn., occurs in dry places, and *G. maculatus*, Thunb., is a plentiful heathland species. *Stenobothrus lineatus*, Panz., is to be found on arid tracts. *Mecostethus grossus*, Linn., occurs on extensive marshlands at Morden, and *Omocestus rufipes*, Latr., at Owermoigne. *O. viridulus*, Linn., and *Stauroderus bicolor*, Charp., are ubiquitous. *Chorthippus elegans*, Charp., appears less plentiful and widely distributed than the abundant *C. parallelus*, Latr. *Tetrix subulatus*, Linn., may be met with often on the heaths and near marshes, as may *T. bipunctatus*, Linn., very frequently on the heaths, and, it would seem, occasionally almost from January to December.—F. H. HAINES; Brookside, Winfrith, Dorset, August 30th, 1919.

ODONATA NEAR LILLE, FRANCE, IN 1919.—On May 17th I saw a large dragon-fly hovering over a canalised river. For a few seconds it hovered motionless about eight or ten inches above the surface of the water. Then it would drop and rise immediately, just touching the surface of the water with its abdomen. This operation it repeated a great many times, and I concluded it was a female ovipositing. There was another specimen which did not indulge in the dipping process, so I concluded that it was a male, and from its general behaviour it appeared to be in attendance on the female. After some little time the female came and settled close to where I was sitting, within four feet of me, and the male followed and settled about two feet away. I was, of course, able to see at once that they were specimens of *Libellula quadrimaculata*, Linn. About five days earlier I caught *Ischnura elegans*, Lind., *Agrion puella*, Linn., and *A. pulchellum*, Lind., and saw a *Pyrrhosoma*. On May 25th I saw a newly emerged male *L. quadrimaculata* clinging to a grass stem with the empty nymph-skin about four inches below him.—D. WHITTAKER; Ashton-on-Mersey.

NEUROPTERA IN THE BALKANS.—A very interesting family of Neuropterous insects, represented in England by only a few small species, is the Megaloptera. Next to the grasshoppers and their relatives, I should think they excited more interest amongst the troops in Macedonia than any others. I was continually having specimens of the largest of them brought to me for identification. This was *Palparcs libelluloides*, which has a strong superficial resemblance to the dragon-flies, although on close inspection and study of its habits it is seen to be entirely different. It is a very large insect, many specimens spreading over six inches. The body is marked in black and yellow very much in the dragon-fly style, but is soft and feeble and the wings are also very much more pliant than those of the dragon-flies. These are extremely beautiful appendages, broad, delicately veined and heavily spotted with black; but their chief beauty consists in the high gloss, which gives the insect a shimmering appearance as it flies about in the bright sunshine. Its flight is very different from the powerful swoop of the dragon-flies,

for although it is pretty wary and seldom allows one to approach very closely while it is at rest, it flies heavily and for a very short distance before settling again. It was rather widely distributed, haunting hillsides covered with long rough grass. In the neighbourhood of Kurkut, on the Spane River, it was exceedingly abundant. Smaller and more delicate, and by repute rather better known, are the ant-lions, whose larvae construct pitfalls in the sand for the capture of their insect prey. I found *Myrmecleon europeus* extremely abundant in several ravines, chiefly in places where these characteristic fissures widen out as they debouch into the plains. Perhaps the most singular and charming insect I met in the Balkans was *Nemoptera coa*. I found it in one place only, but there it was plentiful. It was a mulberry orchard by the side of the Galiko River—a place particularly suitable for all forms of insect life, for two great masses of rock which kept off the biting Vardar wind afforded protection to a large number of tender plants, while small backwaters from the stream provided more moisture than is found in the open plains in summer. At first sight I took these insects for a delicate species of diurnal moth, for they flitted gracefully amongst the rushes and long grass with rapidly beating wings much after the fashion of the Zygænas, but it was not long before I noticed the long streamers, which are the extraordinary development of the hind wings, trailing behind. Beyond taking a few specimens, I was not able to spend much time in the place, greatly to my regret, for I believe the early stages of this insect are still extremely doubtful. *Ascalaphus longicornis* is another insect that was, at first sight, generally mistaken for a butterfly, and even a moderately experienced entomologist might be forgiven for falling into the error. Not only are the wings richly and deeply coloured in yellow and black, but the long antennæ are very distinctly knobbed in butterfly fashion. This insect has a very swift but erratic flight, appearing to dash straight upwards and immediately swoop down again and settle on the grass; but, like the other members of this family, its excursions are always short, and it is easily captured by persistent following. Its appearance, when at rest, is very singular, the curious angle at which the wings are held, combined with the brilliant colouring, being unlike any insect I am acquainted with. It was not very abundant, but during the month of June in both 1917 and 1918 I saw a good many individuals.—
HERBERT MACE, Faireotes, Marlow.

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INSECTS IN BURMESE AMBER.

By T. D. A. COCKERELL.

THE following species were found in Amber, recently received from Mr. Swinhoe, and will be placed in the British Museum. I have not described all the specimens in the collection. Some are so placed that they can only be properly investigated if the amber is cut to bring them closer to the surface ; while others, especially small Coleoptera, are beyond my powers of analysis and classification. Thus future workers, interested in special groups, will find various interesting undescribed forms which I have been compelled to ignore.

HOMOPTERA.

ALEYRODIDÆ.

Aleurodicus burmiticus, n. sp. (Fig. 1.)

♂. Length about $960\ \mu$: wings hyaline, anterior pair faintly dusky, but no spots ; forceps elongate, with a small tubercle on outer side about $112\ \mu$ from tip. The following measurements are in microns : Antennæ about 295 ; hind wing about 720 long and 335 broad ; hind tibia 240 ; first joint of hind tarsus 80, second 50.

In Burmese amber, received from Mr. R. C. J. Swinhoe, a typical *Aleurodicus*, principally remarkable, as compared with living species, for the minute size. It is the first occurrence of the genus in the fossil state. In the modern fauna most of the species of *Aleurodicus* are neotropical, but evidently the genus has long existed in the Old World.

CORRODENTIA.

PSOCIDÆ.

Psylloneura (?) *perantiqua*, n. sp. (Fig. 2.)

Anterior wings about 2,080 microns long, clear, with dark veins, more or less interrupted by light sections or spots ; tarsi three-jointed,

one joint long and two short. Venation as shown in figure. The stigma agrees fairly well with that of *Psylloneura* and *Vulturops*, but is peculiar for the extremely backward direction of the radial branch forming its basal boundary. This is a specialised, not



FIG. 1.—*Alaeurodicus burmiticus*, Ckll.

primitive, condition. The radius beyond the stigma branches as in *Psylloneura*; in *Vulturops* it is simple. The media branches as in *Stenopsoecus* and *Psyllipsocus*. The anals cannot be made out. The cubitus is not angular at the cross-vein.

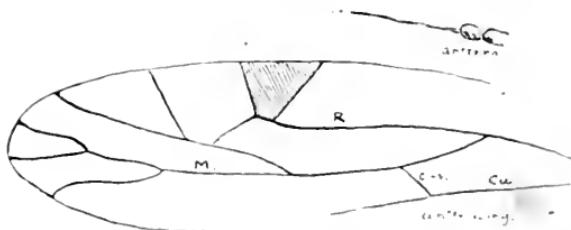


FIG. 2.—*Psylloneura parantiqua*, Ckll.

In Burmese amber, received from Mr. R. C. J. Swinhoe, I am indebted to Dr. N. Banks for copies of Enderlein's figures of *Psylloneura* and *Psyllipsocus*. The fossil should

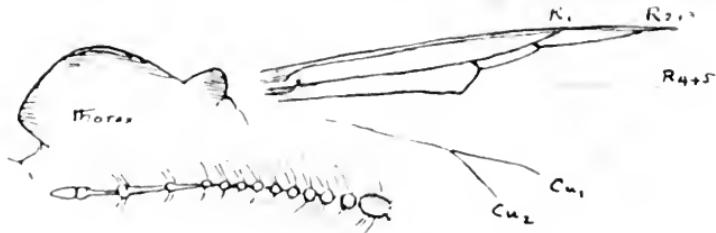


FIG. 3.—*Johannsenomyia swinhonis*, Ckll.

perhaps be referred to a new genus, but the venation of the Psocidae is so variable, even on the two sides of the same specimen, that considerable latitude must be allowed for deviations within the genus.

DIPTERA.

CHIRONOMIDÆ.

Johannsenomyia swinhoei, n. sp. (Fig. 3.)

♂. Length about $1,280 \mu$, abdomen 648μ : antennæ 14-jointed, clavate at end, the three joints before the last elongated; thorax elevated, strongly gibbous, scutellum prominent; femora all slender and simple, the anterior ones with four long hairs beneath on apical half. The following measurements are in μ : Antennæ 560, width of head 320, hind tibia 335, joints of hind tarsus (1) 128, (2) 95, (3) 50, (4) 50, (5) 40.

This is a dark brown species, with perfectly hyaline (spotless) wings. All the tarsal joints have fine oblique hairs beneath, but there are no spines on the last joint. In the modern fauna the species runs near *J. polita* (Coquillett).

No trace of the media can be seen, and the forked cubitus is only seen in a good light. The insect might accordingly be compared with *Brachypogon*, but it is actually quite different. The invisibility of the media is doubtless due only to the manner of preservation. Burmese amber, from Mr. R. C. J. Swinhoe. The venation resembles that of *J. cothurnata* (*Ceratopogon cothurnatus*, Meunier) and *J. sinuosa* (*Ceratopogon sinuosa*, Meunier), from Baltic amber. The knobbed antennæ are peculiar, rather resembling those of *Ceratopogon piriformis*, Meunier, from Baltic amber. The abdomen is stout, resembling that of a female.

This is in the same piece of amber as *Aleurodicus burmiticus*, and 5 mm. from it.

"THE HETEROPTERA OF INDO-CHINA."

By W. L. DISTANT.

Fam. REDUVIIDÆ.

(Continued from p. 211)

(Received from M. R. Vitalis de Salvaza.)

LIST OF SPECIES ALREADY RECEIVED.

Subfam. STENOPODINÆ.

Oncocephalus funeralis, sp. n.

Subfam. SALYAVATINÆ.

Lisarda inornata, Walk.
" *recurva*, Dist.
Valentia apetala, de Vuill.
Petalochirus malayus, Stål.
" *burmanus*, Dist.

Subfam. ACANTHASPIDINÆ.

Centrocnemis ståli, Reut.

Reduvius tonkinensis, sp. n.

Acanthaspis gulo, Stål.

" *biligata*, Walk.

" *laosensis*, sp. n.

" *tavoyana*, Dist.

" *flavovaria*, Hahn.

Inara alboguttata, Stål.

- Velitra rubro-picta*, A. & S.
 " *melanomeris*, sp. n.
Sinanthocoris fuscapennis, Stål.
 " *singularis*, Walk.
 " *zonatus*, Stål.
Stacosteus rugosus, de Castel.
Dysaphis pedestris, sp. n.
 " *lunulabirris*, sp. n.
Tanypus versicolor, Lap.
 " *ruficeps*, sp. n.
 Subfam. PIRALINAE.
Pierocassis derborealis, Stål.
- Ectomocoris atrox*, Stål.
 " *biguttulus*, Stål.
 " *elegans*, Fabr.
Pirates arcuatus, Stål.
 " *affinis*, Serv.
 " *atromaculatus*, Stål.
 " *lepturoides*, Wolff.
 " *sanctus*, Fabr.
Sirthenea flavipes, Stål.

Subfam. APIOMERINE.

- Amulius malayus*, Stål.
 " *confragosus*, sp. n.

Oncophthalmus funeralis, sp. n.

Black or dark piecous; posterior lobe of pronotum a little paler than anterior lobe; apex of scutellum, the legs and rostrum, sordidly luteous; apex of rostrum, apices of anterior femora, apices and central annulation to posterior and intermediate femora, bases, apices and central annulation to anterior tibiae, and central and apical annulation to intermediate and posterior tibiae, black; antennæ black, apical annulation to second joint luteous, second joint longest, first, second and third joints almost subequal in length; pronotum thickly, coarsely piminate, with two central longitudinal carinae scarcely extending beyond base of anterior lobe; extreme apex of scutellum dull, luteous and slightly ascendant; anterior femora strongly thickened, shortly and finely spinulose beneath.

Long. 15-16 mm.

Habitat. Luang Prabang; Don Khoua and Ban Hat Kep.

Relurins tonkineensis, sp. n.

Black; posterior pronotal lobe reddish-ochraceous; antennæ finely pilose, first joint subequal in length to that of head, second joint longer than first, pronotum centrally longitudinally incised through both lobes, the posterior lobe also sublaterally excavated; membrane passing apex of abdomen, legs somewhat longly and coarsely pilose,

Long. 20-21 mm.

Habitat. Tonkin, Chapa.

In appearance very closely allied to *R. (Acauthaspis) humeralis*, Scott, from Japan, but differing by the much narrower central sulcation to the posterior lobe of the pronotum, greater size, etc.

Acauthaspis laosensis, sp. n.

Similar to *A. lata*, Walk., but a smaller and much darker species, the posterior lobe of pronotum much less suffused with ochraceous and its lateral angles practically unarmed (not distinctly spined as in Walker's species), corium much less suffused with ochraceous; antennæ with the first and second joints black, bases and apices of first joint ochraceous.

Long. 15 mm.

Habitat. Laos. Luang Prabang.

Velitra melanomeris, sp. n.

Head, pronotum, scutellum, head and body beneath black : corium and membrane black, the former with a broad, oblique, testaceous fascia at the outer margin of clavus, narrowed inwardly at half its length from base; connexivum black, its outer margin testaceous, legs black or blackish, the tarsi and the anterior tibiae testaceous ; rostrum dark castaneous, robust, second joint a little longer than first ; antennae with the basal joint black, remaining joints brownish-testaceous, first joint about reaching apex of head, second joint about as long as anterior tibiae ; anterior and posterior pronotal lobes centrally longitudinally incised, the posterior lobe also sublaterally incised, the incisures granulate.

Long, 22-25 mm.

Habitat.—Tonkin, Chapa : Haut Mékong, Nam Tiene.

Allied to *V. stigmatica*, Dist., from Assam, but beside the different colour of the legs, the posterior pronotal lobe is more flattened, etc.

Durganda pedestris, sp. n.

Head, pronotum, sternum, scutellum and anterior and intermediate legs, shining indigo-blue ; abdomen and posterior legs reddish-ochraceous, apical abdominal segment, shining indigo-blue ; antennae with the first and second joints black, second about twice as long as first ; head porrect, anteriorly bifidly produced ; pronotum strongly medially compressed, both lobes finely central longitudinally sulcated, anterior angles strongly tuberculously prominent ; anterior femora strongly spined beneath.

Long, 10-11 mm.

Habitat.—Haut Mékong : Luang Prabang ; Ban Nam Mo.

Durganda formidabilis, sp. n.

Dark testaceous ; apex of second joint of antennae, eyes, hemelytra, excluding basal and lateral areas to about half the length of membrane, and sometimes suffusions to abdomen beneath, black.

Long, 13½-14 mm.

Habitat.—Tonkin, Xieng Khonang.

Allied to *D. rubra*, A. & S., but a larger and more elongate species ; the anterior femora more longly and acutely spined beneath ; the head longer and more produced before eyes ; the pronotum narrower and slightly longer, the longitudinal furrows more pronounced ; antennae more robust, the first joint reaching apex of head.

Tiarodes rusticus, sp. n.

Head, pronotum, scutellum and sternum dark shining indigo-blue, posterior lobe of pronotum a little paler than the anterior lobe ; corium black, with a somewhat large apical sanguineous spot, the extreme apex of the corium, black ; legs sanguineous, apices of the femora, bases and apices and longitudinal streaks to the anterior and intermediate tibiae, the whole of the posterior tibiae and tarsal

spots, black or blackish, abdomen beneath dark ochraceous, outer areas of the third and fourth segments and the whole of fifth and sixth segments dark indigo-blue; rostrum with the basal joint about reaching eyes, a little longer than second joint; both pronotal lobes broadly longitudinally sulcate, anterior pronotal angles tuberculously prominent.

Long. 22 mm.

Habitat.—Tonkin, Chiapa.

Allied to *T. varicolor*, Stal.

Amulius confragosus, sp. n.

Head, antennae and rostrum black; pronotum dark bronzy-brown, the anterior lobe sometimes black; scutellum, corium and membrane black, body beneath ochraceous; disk of mesosternum and macular markings to lateral margins of same, and sometimes base of apical abdominal segment black, or blackish; legs black, bases and apices of anterior femora and base of anterior tibiae, bases and subapical annulations to intermediate and posterior tibiae, coxae and trochanters ochraceous; an ochraceous spot near apex of corium; antennae moderately robust, first joint longer than head; anterior angles of pronotum on each side behind head, distinctly spinous; anterior tibiae longly palely hirsute; connexivum more or less spotted with ochraceous.

Long. 22-27 mm.

Habitat.—Laos; Luang Prabang.

Allied to *A. armillatus*, Bredd., from Borneo.

A NOTE ON SOME DRAGONFLIES FROM NEW BRITAIN.

BY HERBERT CAMPION.

Whilst going through the exotic Odonata in the Cambridge University Museum of Zoology a few years ago, I found a small collection made in New Britain by Dr. Arthur Willey, during his expedition to that and other islands in 1895-1897. These insects were not dealt with in the "Zoological Results" of the expedition (Cambridge, 1898-1902), and a list of them is now submitted.

The most interesting capture was a species of *Idiocnemis*, a genus of Agrionidae not previously recorded from New Britain. Dr. F. Ris, to whom I sent specimens in May, 1914, was at first inclined to regard the species as a new one, notwithstanding its general agreement with the description of *I. inornata*, Selys, from Karoons, Dutch New Guinea. It was not, however, until the present year that it became possible to obtain fuller information about De Selys' type, and that any degree of certainty on the subject could be reached. In January last I sent the accompanying figure of the terminal segment and

appendages of the male to Monsieur G. Severin, of Brussels, who was kind enough to compare it with the male type of *inornata*, preserved in the Musée Royal d'Histoire de Belgique. He thereupon informed me that the structures shown in the figure correspond exactly with those of the type, even including the marginal denticles. The specific identification may now be taken as settled, and I am not even sure that a varietal name is called for, judging from two or three males, in poor condition, obtained in New Guinea by A. R. Wallace, and standing over the name *inornata* in the British Museum (Natural History). It is true that Willey's specimens are of large size, but the species is certainly very variable in that respect.

I am not aware that any figures of the male anal appendages of *I. inornata* have hitherto been published. Moreover, as the New Britain insect differs to some extent from De Selys'



Idioenemis inornata, Selys, ♂, New Britain. Left profile view of the terminal segment and anal appendages.

description of the species, it seems advisable to give a short account of a male and female from Dr. Willey's collection which have been acquired, by exchange, by the British Museum.

♂. Length of abdomen, including anal appendages, 37·5 mm.; length of hind wing 25 mm.

Labium yellowish-brown. Labrum, clypeus, frons, and upper surface of head reddish-brown. Genae yellowish, with a large lunulate black spot between the postclypeus and the eye on each side. A low ridge crossing the frons between the antennae. Basal three joints of antennae reddish-brown; the remaining joints black. The paired ocelli ringed round with black. Postocular spots large, black, and rounded.

Pronotum reddish-brown. A large oval black spot between the coxae of the forelegs. Hind margin of prothorax elevated and somewhat rounded. Meso-metathorax with dorsum reddish-brown, shading into yellowish-brown at the sides; mid-dorsal carina black.

Legs reddish-brown above, paler below; tips of tarsi black.

Wings with black venation. Pterostigma pale brown, yellowish round the edges. Postnodals in fore wings 19, in hind wings 18.

Abdomen very slender, dilated at both extremities; segment 1 yellowish-brown, dark brown at the apical margin; 2 dark brown above, yellowish-brown at sides; 3-6 blackish-brown, with an ill-defined yellowish-brown area of variable extent at the base; 7 blackish-brown, yellowish-brown at the apex; 8-10 bright yellowish-brown, 10 less than half as long as 9, the apical margin carrying dorsally some six or seven minute horizontal denticles, and laterally a black tooth-like projection on each side, also directed backwards.

Anal appendages bright yellowish-brown. The upper pair somewhat longer than segment 10, curving towards one another, but well separated at the tips, broad at base, and gradually narrowing towards the rather blunt point. The lower appendages a little shorter than the upper, tipped with black; in lateral view very broad at base, suddenly narrowing, and curving a little first downwards and then upwards, in ventral aspect tapering towards the apex, somewhat convergent.

The five specimens vary a good deal in size. The one selected for description is the largest, the length of the abdomen being 37·5 mm., as compared with the measurements of 30·5, 35·0, and 35·5 mm. obtained from other specimens, and the length of the hind wing being 25 mm., as compared with 23 (in three males) and 23·5 mm. in the other example. The number of postnodal cross-veins is also variable, six fore wings having 19, three 20, and one 21, and one hind wing possessing 17, eight 18, and one 19.

Length of abdomen 34 mm.; length of hind wing 24·5 mm.

Labium and labrum yellow. Clypeus and frons pale reddish-brown. Genae yellowish, marked as in the ♂. Frontal ridge less distinct than in ♂. Upper surface of head copper-brown. Basal three joints of antennæ copper-brown; the remaining joints missing. No postocular spots visible in the unique female specimen. Pronotum copper-brown. A large oval black spot between the coxae of the fore legs, as in the ♂. Hind margin of prothorax elevated, straight for the greatest portion of its length. Dorsum of meso-metathorax copper-brown; mid-dorsal carina black; sides and under-surface yellow.

Fore and mid legs pale reddish-brown; tips of tarsi black. (Hind legs missing.)

Wings with venation and pterostigma as in ♂. Postnodals in fore wings 20-21, in hind wings 19.

Abdomen rather stout; dorsum of segment 1 pale yellowish-brown; 2 with the basal two-thirds dark yellowish-brown and the apical third blackish brown, enclosing a large semi-circular spot of pale yellowish-brown; segments 3-6 blackish-brown, with a basal ring of pale yellowish-brown on each, narrow on 3, wide on 4 and 5, and obscure on 6; 7 very dark brown basally, and paler apically; 8-10 bright yellowish-brown. Anal appendages bright yellowish-brown, pointed, barely as long as segment 10. Ovipositor bright yellowish-brown, curving backwards a little further than the anal appendages.

Five other species were secured by Dr. Willey, and the identifications adopted for them are those with which Dr. Ris was good enough to furnish me.

AGRIONIDÆ.—*Argiolestes aurantiacus*, Ris, 2 ♂.

LIBELLULIDÆ.—*Nesoxenia mysis dahli*, Ris, 1 ♂. *Agrionoptera insignis similis*, Selys, 1 ♂. *Orthetrum rillosovittatum bismarckianum*, Ris, 2 ♂, 2 ♀. *Neurothemis stigmatizans bramina*, Guér., 1 ♂.

Our knowledge of the Odonate—fauna of New Britain and the archipelago to which it belongs is contained in two papers by Dr. Ris, namely, "Neue Libellen vom Bismarck-Archipel" ('Ent. Nachr.', xxiv, pp. 321–327, 1898), and "Libellen vom Bismarck-Archipel" ('Archiv Naturgesch.', lxvi (i), pp. 175–204, pl. ix, x, 1900).

ORTHOPTERA IN CAPTIVITY.

By W. J. LUCAS, B.A., F.E.S.

HE who undertook to rear even our own small company of Orthoptera would usually have a difficult task before him. The earwigs, however, would probably give him somewhat less trouble than the rest. One favourite hibernaculum and nursery of the common earwig is a decaying, but fairly dry, branch of a tree lying on the ground. Batches of its eggs may generally be found in the spring without much difficulty by breaking up these fallen branches. The eggs, when found, should be taken, with the mother and some of the soft touchwood, and placed on a layer of slightly damp earth or sand in a sufficiently large, ventilated glass-topped box, or in a small fish-globe, whose orifice has been covered with muslin. The eggs will soon hatch, and if the mother and young are fed on small insects or other animal food, with fragments of grass or sweet fruit as a variant, in a few months the nymphs will reach maturity, unless lack of food should induce cannibalistic tendencies in them or their mother. To get the adults to pair and lay eggs in captivity would probably be not so easy a matter.

Fish-globes topped with muslin are suggested as convenient vivaria for the rest of our Orthoptera, if it is desired to keep them alive in captivity for purposes of observation, and this can be done without any difficulty. To rear them through all stages would be a very different thing, though there may be naturalists with sufficient leisure and enthusiasm to attempt it. With breeding-houses of sufficient size, in which the environment is such as is customary with the species concerned, no doubt this might be done; but as the cages increased in effectiveness in this respect there would be a corresponding decrease in their value for the purpose of observing the habits of their occupants. The insect-house at the Zoological Society's Gardens in Regent's

Park would seem to be the place where the entomologist might look for suggestions in such matters.

Meanwhile all that seems feasible in nearly every case is to keep under observation the insects in whatever stage they may be seenred. As already suggested fish-globes make very efficient vivaria. They should contain a layer of earth or sand, which must be kept slightly moist, while a living grass plant would give, for the Locustids and Acridians, a somewhat home-like habitation. With the exception of the two species of *Tetrix*, all the latter feed on grass apparently, and it is an interesting experience to watch them eating it. *Tetrix* feeds on very low forms of vegetable life found on the surface of the earth.

Perhaps some of the Locustids require animal food, at least occasionally, for it will soon be discovered that they readily become cannibals in captivity when food is short. This is true in fact of all our Orthoptera except the Acridians.

Cockroaches and crickets are omnivorous feeders, with probably a preference for animal food, and the former, or at any rate the larger species are somewhat disgusting animals to keep in captivity. This, however, is not the case with our three small native species of the genus *Ectobius*.

28. Knight's Park,

Kingston-on-Thames;

September 20th, 1919.

PRESERVING ORTHOPTERA.

By W. J. LEES, B.A., F.E.S.

It goes without saying that a collection of Orthoptera can never make so fine a show as do rows of Crimson Underwings, Clouded Yellows, Purple Emperors, or even Garden Whites. In most cases collections will be made specially for scientific purposes, with only a secondary regard for appearance. Some of those who study the Orthoptera, therefore, may prefer simply to keep their specimens in tubes of dilute spirit or in a 5 per cent. solution of formalin, supplementing them by microscope mounts of details in fluid, jelly, or Canada balsam.

Probably, however, the majority will think it better to pin out their specimens in the usual way. In this case if the species possesses organs of flight some examples of both sexes should be shown with wings expanded. For setting them butterfly setting-boards are not to be recommended, for, whatever the merits, if any, of curved wings in the Lepidoptera, they seem to be quite out of place in the Orthoptera. The groove, too, must be somewhat wider and of rectangular section to properly accommodate the legs and allow of their being displayed symmetrically, for

the legs are quite as important as the wings. Besides, a flat-set insect is much more easily photographed if the necessity arises, and it often does. The wings of earwigs when present are not easily displayed, but still, some must be prepared as well as may be for purposes of examination.

Most specimens will, however, as a rule be set in the usual resting position with wings closed and legs arched. This may be done by pinning them on a sheet of thick cork, when the legs may easily be arranged with the forceps and kept in position with small pins. As they dry rather slowly they must not be removed from the cork too soon. These specimens may be pinned behind the thorax, leaving the pronotum intact for examination when needed. Assuming that such examples are available, it will not matter if those set with wings spread are pinned through the thorax, which seems to be the most convenient place.

Of the various methods of killing insects with a view to their preservation not all are suitable for Orthoptera. The cyanide-bottle is the most convenient means, but in it the insects become *very* rigid, and the characteristic hind legs then break off on the slightest provocation or even with none. The rigidity, however, passes away in a few hours and then setting may take place without danger. The laurel-bottle obviates this difficulty, but I am not certain that the vapour does not affect some of the colours. I have some doubt, too, about benzine and similar reagents, which, moreover, also make the insects rigid. It is, of course, unnecessary to say that full data must be put with the insects *at once*, for an unlabelled insect is practically useless, and the memory even of a naturalist may not always be reliable.

Pinning is rather unsatisfactory with earwigs and small cockroaches, which certainly keep better carded in the same way as a coleopterist cards his beetles. Nor does this method matter so long as some are mounted in such a way as to show the underside. Earwigs almost always discolour the cards, so after a time it is necessary to float them off and remount them. This is easily done, as the legs and antennæ do not quickly relax. In many cases it is advisable to dissect one of each sex and mount on a card the important or distinctive parts. If neatly done the mounts may be pinned in the cabinet-drawers with the set insects without detracting from the general appearance.

Nymphs collapse very much in drying. Nevertheless they should be kept also when they can be obtained and identified with certainty. Empty nymph skins might also be preserved.

No doubt a carded collection of Orthoptera looks much neater than one of pinned specimens, and perhaps some orthopterists may prefer this arrangement. If so, for purposes of critical examination, this collection should be supplemented by tubes of specimens.

Though many of the Orthoptera lose their colours but little in drying, it is unfortunately the case that in some species the colours disappear most dismally after death. The worst two are perhaps *Leptophyes punctatissima* and *Conocephalus dorsalis*, while *Pholidoptera griseoaptera* and *Metrioptera roeselii* are serious offenders in this respect. The change seems to be due to some of the contents of the body becoming greasy, and the oily matter diffusing over the insect obscures the colours. To a great extent this result may be prevented by eviscerating the specimens as soon after death as possible. The treatment is as follows: After being pinned on its back by very fine pins through the neck and end of the body, a cut is made along the ventral surface of the insect with sharp-pointed dissecting scissors and the contents of the abdomen and thorax are removed with a pair of fine-pointed forceps. The thorax need not be cut, as its contents may be extracted through the slit in the abdomen. A tiny roll of cotton-wool should then be put in the empty body to restore its shape. Eggs may be obtained and kept for reference in spirit or formalin when a female happens to be killed at the right moment. If *Labidura riparia* is put into weak formalin before being mounted it retains to a great extent its natural pale tint, and perhaps it might be an advantage to treat other Orthoptera with a bath of formalin or spirit before setting. This, however, would not be advisable if the wings were afterwards to be expanded.

28, Knight's Park,
Kingston-on-Thames;
September 29th, 1919.

THE EARLIER STAGES OF *PERONEA MACCANA*, TR.,
P. LIPSIANA, SCHIFF, P. RUFANA, SCHIFF, AND
P. SCHALLERIANA, L.

By W. G. SHELDON, F.Z.S., F.E.S.

THERE is not at present a description of the larva of three of these species: of the fourth, *P. rufana*, the only description known to me is of the full-grown larva by Barrett in 'Brit. Lep.', x, pp. 235-6, and the pupa, in which stage it is perhaps most easily distinguishable from the nearly-allied *P. lipsiana*, has not been described. I had been trying to work out the earlier stages of *P. schalleriana*, and what is almost certainly its variety *P. comparana*, Hüb., for several years, but as my efforts were not brought to a conclusion until this year, when I found the larvae not uncommon in the Black Wood at Rannoch, at the time that I was searching for those of the other three species, I have included my observations on this species with them.

The Rev. J. W. Metcalfe, whilst staying last year in the Rannoch district, obtained a number of *Tortrix* larvæ from *Myrica gale* and *Vaccinium*, and from these bred imagines of *P. maccana* and *P. rufana*, without, however, identifying the larva of either species, or separating them (see 'Entom.', li, p. 265).

Mr. Metcalfe very kindly described to me the spot in which most of these larvæ were obtained, and this year I found considerable numbers of both there. For the ova of *P. lipsiana* I am indebted to the kindness of Mr. F. G. Whittle, who forwarded to me females from Rannoch in the spring of 1918; unfortunately these ova were not fertile, and I am unable to deal with the earlier instars of the larvæ of this species.

P. maccana, Tr.

Larva in last instar and full-grown, about 13 mm. long: head amber-coloured—in some instances light brownish-green—and glabrous; black round the mouth, on each side of the mouth is a black round dot, very small but conspicuous. Prothorax is the same colour as the head but it is not glabrous; the segments at the rear of prothorax, claspers and prolegs are light bluish-green; there are very slight traces of an anal plate, the tubercles are prominent and noticeable, the spiracles inconspicuous.

These larvæ were to be found of all sizes, from what was probably the second instar to those ready to pupate, about the middle of July; they were practically identical in all stages, and were easily recognisable from any other larva feeding at the time on the same plants—in fact, I had no difficulty in separating them. The distinct black spot on each side of the head would at once distinguish them from any *Tortrix* larva that I can remember having seen.

They were found both by Mr. Whittle and myself in considerable numbers in the Black Wood upon *Vaccinium ritis-idea* and *V. myrtillus*, and on the open moors to the west of it in the vicinity of the Camghouran Burn upon *Myrica gale*.

Whether feeding upon *Vaccinium* or *Myrica* they spun the leaves of a shoot together, forming a tube and living therein. The pupa is about 7 mm. long and 1·75 mm. broad; the head, thorax and wing-cases are yellowish-green, smooth and somewhat glabrous; the abdominal segments are reddish-brown; the head is rounded, and there is no trace of a pupa opener; the wing-cases reach to the centre of the fifth abdominal segment; the abdominal segments taper gradually and regularly to the anal segment, which terminates in a square end looked at from above; at each point of this is a hook which points ventrally. (This arrangement of gradually tapering abdominal segments, square end and hooks, applies to the pupæ

of all four species described in this paper.) Each abdominal segment has dorsally a row of spikelets pointing rearwards, and a number of spines which also point to the rear.

Out of about two hundred larva collected, about five dozen imagines resulted: the remainder were infected by parasites, which were especially fatal to those feeding on *Myrica gale*. The imagines commenced to emerge with me at Croydon on August 12th and the last on September 1st. I gather that Mr. Whittle's specimens, which were kept in all their stages in the cooler air of their northern mountain home, were about a week later.

P. lipsiana, Schiff.

Ova.—The ova is horizontal, .9 mm. long, .48 mm. broad, and .18 mm. high; the surface is opalescent and divided by very fine slightly raised ribs into a large number of irregularly-shaped spaces: when newly deposited the envelope is transparent and colourless, with an irregular-shaped nucleus yellowish-green in colour; this nucleus extends to almost the entire area. The ova was deposited on a spray of *V. myrtillus* on April 27th, 1918.

Larra.—In early instars, probably second or third, the head is dark brown and intensely glabrous, as is the prothorax, which is black, divided in centre longitudinally by a very thin whitish line. The junction between the head and prothorax is dark brownish-green; the segments at the rear of the prothorax and the claspers are dark brownish-green; the thoracic legs and feet are black and glabrous; the anal plate is hardly noticeable; tubercles and spiracles inconspicuous.

The larva in the last instar and full fed is 13 mm. long; the head is light chestnut-brown, darker round the mouth, highly glabrous, and with the lobes prominent. The prothorax is glabrous, greenish-brown in front: at the rear there is on each side a semi-crescent which is intensely black; the prolegs and feet are brown and glabrous; the segments at the rear of the prothorax and the claspers are brownish-green, somewhat lighter than in the earlier stages; the anal plate, tubercles and spiracles are not conspicuous.

Pupa.—The pupa is 8 mm. long and 1.75 mm. broad, rather slender. The head, thorax, and wing-cases are dark brownish-black, slightly glabrous but roughened: the wing-cases are striated longitudinally. The cases of antennae are prominent; the head is rounded and is without a pupa opener; the wing-cases extend to the rear of the fifth abdominal segment. The abdominal segments are dark reddish-brown with a tinge of green; each abdominal segment has dorsally a transverse row of spikelets in the centre, and one not so large in the front and rear; it has also some spines, all of which, spikelets and spines, point rearwards.

The only note on the larva of *P. lipsiana* that I can find is in Barrett, 'Brit. Lep.', x, p. 234, which reads: "Larva green with brownish head; feeds upon *Vaccinium vitis-idaea* in July, other authors say upon birch and wild apple."

The larvæ are to be found at Rannoch on *V. myrtillus* and *V. vitis-idaea*, perhaps most frequently upon the former; they are apparently generally distributed upon these plants. I obtained about two dozen, with a much larger number of *P. maccana*, one afternoon in the Black Wood, and three or four dozen on some hillocks around the house at which I stayed at Camghouran; this was situated immediately to the west of the Black Wood. One larva was discovered on *Calluna vulgaris* whilst searching for those of *P. mixtana*, which were common. This larva when offered *C. vulgaris* and *V. myrtillus* immediately took to the latter. Probably, like so many of the *Peroneas*, it will, on necessity, feed upon various plants, but I did not breed a single example out of the hundreds of larvæ I obtained upon *Myrica gale*.

The larva spins the leaflets of a spray of *Vaccinium* to each other, forming a tube similar to that of *P. maccana*, in which it lies concealed, but in the case of the present species the tube is considerably longer—in some cases it has a length of two or three inches. In confinement it is particularly irritable, resenting the presence of other larvæ of the same species, and if interfered with in its tube by one will vacate it. When I first had a stock I kept them rather crowded in a glass-top tin; under these conditions a number were continuously wandering about without feeding. I afterwards came to the conclusion that unless each had a separate spray in which to form its tube, and the entire use of that tube without molestation, they would not thrive. When they had plenty of room they were quite content, but the result of the earlier crowding was that many of the moths bred were not full size.

P. lipsiana is distinctly a later species than *P. maccana*. My first moth emerged on August 19th and the last one on September 4th. A series of two dozen examples was bred. I should give the second half of July as the time for the larva to be full grown.

(To be concluded.)

NOTES AND OBSERVATIONS.

DRAGONFLY AT LIGHT.—In the 'Entomologist,' 1895, pp. 62 and 314, I have recorded a few species of Neuroptera taken at light by me during that and the preceding year. Certain Trichoptera are common in such a situation, but I cannot recall noting any of the Odonata at artificial light; nor, I think, does Mr. Lucas mention such an occurrence. Consequently I was most surprised to see and hear a great *Æschna cyanea* careering around the dining-room lamp here just an hour after dusk on August 20th, 1919.—CLAUDE MORLEY; Monks Soham, Suffolk.

LARVAL FOOD-PLANTS OF *XANTHOCEIA FLAVAGO*.—I have been taking the pupae of *Xanthocea flavago* rather plentifully here during the last week of July; and as they were found in plants of many species my experience during this and former seasons may be worth recording. The plants yielding the largest number of pupæ have been *Carduus palustris*, *C. acanthoides* and *Digitalis purpurea*. I took sixty pupæ from the last-named plant this year, but this was in a spot where all the other food-plants were absent. The next most productive plants were *Carduus lanceolatus*, *C. acanthoides* and *Senecio jacobaea*. The following plants produce pupæ occasionally, more in some years than in others: they appear to provide a kind of stand-by when the above-mentioned plants become scarce, as they do at intervals: *Arcetum lappa*, *Artemisia vulgaris*, *Rumex crispus*, *R. obtusifolius* and *Sympyrum officinale*, but the larvae appear particularly unhappy in the last on account of its watery nature. There is considerable difference in the position of the pupæ in the stems, varying with each plant, but fairly constant in each species. I think this is governed by the thickness of the tissue between the pupæ and the cuticle at the point where the larva eats outward to form the exit hole. This is seen by comparing *Digitalis purpurea*, where I find the pupæ about a foot up the stems, which are nearly solid below, and *C. acanthoides*, the stems of which are very hollow throughout. Here the pupæ are at the bases of the stems, with the exit hole three or four inches above. The larva when gnawing out the exit hole stops short at the epidermis, which it leaves unbroken, like other larvae with similar habits.—A. H. THOMPSON; 54, Church Road, Northwich.

COLOUR VARIATION OF *ODEZIA ATRATA*.—On July 8th, 1918, in a meadow near Burnley, *O. atrata (chaerophyllata)* was flying very abundantly, and among them was a very light form, which I captured. It was in fine condition and of a golden-brown colour.—W. G. CLUTTER; Burnley.

THE ISSUERS OF EAST GRINSTEAD DISTRICT.—An effort is being made to bring together the entomologists of the East Grinstead neighbourhood with the object of compiling a local list of insects, and generally to help young and old entomologists in studying the insects of this neighbourhood. Mr. F. J. Hanbury, F.L.S., F.E.S., has kindly consented to be patron of the society. Anyone interested in the above is requested to communicate with me.—H. C. JIDDENS (Fisher Major), Apsley Town, East Grinstead.

APPLE APHIDES. The disease of apples, commonly known as spots, dolphin or blue bug blight, is at times a source of serious loss to fruit growers. It is caused by one or more of eight different kinds of plant lice or aphides, but by far the greatest damage is due to four only. These are (1) the blue bug or rosy apple aphid, (2) the green apple aphid, (3) the oat apple aphid, and (4) the woolly aphid or American blight. The first three of these aphides are dealt with in Leaflet No. 330, which has just been issued by the Board of Agriculture. After pointing out the characteristic nature of the damage done by each of the aphides, the leaflet traces briefly their life histories, and finally suggests treatment for destroying the pests.

The only satisfactory method is to use a suitable spray, and recommendations are given as to the best times to apply the sprays and how to make them. Copies of the leaflet can be obtained free of charge and post free on application to the Board, 3, St. James's Square, London, S.W. 1.

AGROTIS PRÆCOX IN WESTMORLAND.—As I believe there is only one previous record of *Agrotis præcox* for Westmorland (Kendal, 1899), and as inland occurrences of the moth are very uncommon, I think it worth while placing on record that two specimens in perfect condition were taken at Windermere between the years 1907 and 1910. Unfortunately they were erroneously identified at the time and no importance was given to them; however, when my friend, the Rev. A. Miles Moss was looking through the collection a few days ago he at once recognised them as *A. præcox*. One specimen was taken by Miss M. Garnett and the other by myself. They were taken in separate years.—D. G. GARNETT: Dalegarth, Windermere.

OPISTHOGRAPTRIS LUTEOLATA FEEDING ON LAUREL.—Last autumn I found a larva of *O. luteolata* feeding on laurel. The colour of the larva was a beautiful apple-green, the projections being reddish-brown. The imago was a quite typical "Brimstone."—E. T. ANQUETIL; 15, The Burroughs, Hendon, N.W. 4.

APATURA IRIS AT SEA NEAR BRIGHTON.—In July, whilst deep-sea fishing two miles off Brighton, a friend of mine saw a male specimen of *A. iris*. It came from the direction of France, flew twice round the boat, and then continued its flight towards the land.—F. G. S. BRAMWELL; 1, Dyke Road Drive, Brighton.

LIMENITIS SIBYLLA AT BRIGHTON.—This species was general this season in nearly all the Sussex woods, and a specimen was taken in a garden in Brighton.—F. G. S. BRAMWELL.

HYLOICUS PINASTRI IN SUFFOLK.—During the last three years I searched keenly for *H. pinastri* on the thousands of pine trees round about Heathfield but absolutely without success, so this year I resolved to go to Suffolk and make a great effort to obtain the species. During the twelve days I worked for it I tramped scores of miles, and searched many thousands of pine trunks. I started operations on July 27th. The first find was a female on pine trunk number 71, and at the end of a hard day's work of over nine hours' close hunting I had three to my credit. The next four days were absolutely blank as regards *H. pinastri*, but the following came under my notice: Plenty of *psi* and *rumpicis*, three *aceris*, two *occulta*, three *cytisaria*, four *megacephala*, and plenty of *repandata*, *polyodon*, etc. August 1st was a red-letter day, for I was rewarded for some stiff work by a take of eight, August 2nd two, August 3rd one, August 4th blank, August 5th one, August 6th three, August 7th five. Now a few words for the benefit of future hunters for this insect. Carry but little impedimenta, for trampling among the bracken is tiring, but take with you the fiery enthusiasm of youth, and the fanatical zeal of the keenest entomologist. If after two or three unsuccessful days your spirit sinks, start the next day with the firm resolve to work harder, keener and longer, and you may be quite sure that success will

crown your efforts. With regard to the position of *pinastri* on the trunk, I found one three feet from the ground, one nineteen feet from the ground, and the rest were nearly all about nine feet from the ground. With two exceptions they all were on the sunny side of the trunk, and received the full glare and heat of the sun. I worked from Aldeburgh, which was my headquarters, to Thorpeness, Leiston, Saxmundham, Wickham Market, etc., but undoubtedly the large woods near to Saxmundham are the stronghold of the moth. There was very little variation in the markings, but one male was of a fine reddish-chocolate tint. E. CRISP: "Heatheote," Heathfield, Sussex.

Hylocoetes pinastri IN SUFFOLK.—On September 19th my children found a larva of the Pine Hawk moth, nearly full grown, feeding on a pine tree on Hazelwood Common, near Aldeburgh. I do not know whether this is a capture of any special interest but am writing you in case it should be.—H. M. SILLAR: 11, Egerton Gardens, Hendon, N.W. 4, September 23rd, 1919.

Crocallis elinguaria, FORM *SIGNATIPENNIS*.—Under the description of this form ('Entomologist,' October, 1919, p. 227), referring to the sharp point of the transverse band at the inner margin, we read—"One fails to find reference to any marked variation in the shape of the transverse band." I shall be surprised if it turns out that this form is not well known to lepidopterists throughout the country. Here, I believe, it is fairly common; at any rate, out of the eleven Huddersfield specimens in my series, two are of the form, and two others as near it as possible, the united cross-lines all but forming a sharp point at the inner margin. One of my specimens is figured in Barrett's 'Lepidoptera of the British Islands,' vol. vii, pl. cxciii, fig. 1g. Here we have never regarded the form as much out of the ordinary. But the ground-colour of the wings in my specimens is normal: the only one I have with a decidedly dark buff ground-colour was bred from the only larva of the species I brought away from Rannoch many years ago, and in it the band is of the more usual shape.

GEO. T. POUARR. Elm Lea, Dalton, Huddersfield, October 8th, 1919.

Since writing the foregoing I find that a very fine specimen of the form, taken by the late Mr. John Grassham, presumably at Leeds, is figured in Mosley's 'Varieties of British Lepidoptera' on the plate of *C. elinguaria* at fig. 5. In this figure the resemblance of the shape of the band to the head and bill of a bird is still more pronounced than in the Delamere specimen. It may be that the form is more common in the northern than the southern counties.—G. T. P.]

NOTES ON LEPIDOPTERY AROUND ALTON, HANTS.—*Limenitis archippus* has undoubtedly increased and spread widely of late. It is an insect noticed by non-entomological country-lovers, and though it abounds now in Alice Holt, they tell me it was not so a few years ago. Apart from the Holt, I myself noted it near Tilford, in woods near Alton, on Bramdean Common, and it was reported near Alresford. First seen June 21st. *Dryas paphia* was common in parts of the Holt, where I took a good var. *valenzina* and a worn specimen with the black spots expanded into blotches. On September 6th I found numerous *Zephyrus betulae* on bramble blossom about 4 p.m. (summer time), but they were worn, the males hopelessly so. I took

nine of the best partly on that day and three days later when I again found them. A friend who looked for them in the morning could not find them. The only other flower I ever saw them visit was hemp agrimony. Butterflies generally appeared to be abundant, but this being my first year here I cannot speak comparatively. I have observed *Augiaades comma*, however, on a small patch of down near Alresford during several recent summers, but never saw it so abundant as this year. I watched a female ovipositing. She laid a rather large white egg on a very thin hair-like grass. The base of the egg was broader than the grass and looked most insecure and conspicuous, seeing that it had to stay there for six months, but no doubt she was a better judge than I! Vanessids were not common in the autumn. It is the first summer for years that I have not seen *Pyrameis cardui*, and I only saw *P. atlanta* once or twice. A single *Eugonia polychloros* kindly came into my study on August 3rd. *Vanessa io* was the commonest of the group. I found 37 species of butterflies within a ten-mile radius and expect to add more in a year or two. Beating larvae of *Thera juniperata* near Alresford (since emerged), I found a battered *Laspeyria flexula* in the umbrella (August 26th). I found larvae of *Sphinx ligustri* only half grown at the end of September, and the last "went down" on October 8th—a very late date. *Eucosmia certata* came to light in May and I found the larvae in June on the holly-leaved barberry (*Mahonia*) in the garden. There is no wild *Berberis* in this part of the world, so that this must be an isolated and surviving colony. (The house and garden date from 1642 A.D.) On June 17th I found numbers of *Hepialus hectus* hovering over a patch of nettles at sunset. There was no sign of *Pteris aquilina* within a mile, and I feel sure it has some other food-plant—possibly the nettle. I also captured one *H. fusconebulosa*, but that was near some bracken. Speaking of food-plants I think there is no ground for the belief that *Bapta bimaculata* prefers wild cherry. I found it in some numbers in old sloe-bushes in a wood, while a patch of wild cherry in a neighbouring locality produced none. I wonder if other localities are experiencing an extraordinary swarm of "Ladybirds" this autumn. My room is full of them trying to hibernate in clumps in corners of the windows, etc., and they are everywhere. *Pararge megæra* is thinly distributed about here; *P. egeria* var. *egerides* is scarce—I saw only one in Alice Holt—but it is commoner about Selborne.—E. A. C. STOWELL; Eggar's Grammar School, Alton, Hants.

COLIAS EDUSA IN SCOTLAND.—I saw a specimen of *C. edusa* fly over the river Don here on September 4th, and I saw another that was captured at Craibstone four or five miles from the city.—L. G. ESSON; 6, Esslemont Avenue, Aberdeen.

COLIAS EDUSA AT CHICHESTER.—Two or three specimens of *Colias edusa* were seen flying in clover-fields in this locality by my friend and neighbour, Mr. Humphry, the last noticed on September 18th. The butterfly has occurred only very sparingly here for several years past so far as our own observations go.—JOSEPH ANDERSON; Chichester.

ISSORIA (ARGYNNIS) LATHONIA AND COLIAS EDUSA AT FOLKESTONE

AT DOVER.—A few weeks ago my friend Lieut. Neville H. Gurney, of the Worcestershire Regiment, who is now stationed at Dover, but whose family reside here, was home on leave, and came to see me one afternoon and have a butterfly talk. He told me he had seen a specimen of *L. lathonia* one day below the cliffs near Folkestone, but not having a net was unable to catch it. I advised him to keep his weather eye open when he returned, and to let me know the result. I learn from him yesterday (September 24th), and he tells me he has not seen another *lathonia*, but several *Colias edusa* near Dover, where *Mesacantha galathea* has been swarming. The *lathonia* was seen on July 28th "below the cliffs at Folkestone, and was settled on some pink sea flower."—GERVASE F. MATHEW; Dovercourt, Essex, September 25th, 1919.

COLIAS EDUSA, F.R.C., IN WEST CORNWALL.—I saw a *C. edusa* flying along the high-road between Penzance and Hayle in the first week in September, and about a fortnight later I was shown one that had been taken in Copperhouse (part of Hayle) a day or two before. These are the only two instances of the appearance of this butterfly in the district this year which came to my notice during a visit of some six weeks, beginning on September 1st. Lepidoptera (with the single exception of *M. brassicae*) generally seemed to me to be scarcer than usual; notably there was hardly a specimen of *Aglais urticae* to be seen, though it is usually abundant in September in those parts. Empty pupa-cases of *A. filipendulae* were not ubiquitous as in former years, and larvae of *M. rubi* were decidedly fewer. Of these a curiously large number were found dead when only partially grown. As before, both the pupa-cases of *A. filipendulae* and the larvae of *M. rubi* were far more numerous on the west than on the east side of the estuary; yet the terrain on either side is of the same character.

HAROLD HOBSON; 9, Highbury Place, N. 5.

COLIAS EDUSA VAR. *PALLIDA* (HELICE).—Twice recently, whilst playing golf on Dawlish Warren, I have seen this butterfly. Being without a bat, or i. not carrying a net in my bag, I was unable to effect a capture, but I "downed tools" and stalked them sufficiently close to identify the species. One was very white and I almost thought that it might be *C. hyale*. Mr. F. C. Woodforde, however, to whom I spoke of the matter, pointed out that, so far as he knew, it was not *hyale*; you and that therefore they were almost certainly *pallida* (see *loc. cit.*). I have also seen two more specimens on the railway banks near Dawlish. C. M. MAYOR; Dawlish, September 25th, 1919.

COLIAS HYALE IN LEICESTER. *Colias hyale* made its appearance in Leicester on Thursday, September 11th, on the Leicester City Football Grounds at six o'clock in the evening. It was flying over the heads of the spectators on the grounds, and was quite distinguishable. The weather was extremely bright at this time, which may have been the reason for it being late on the wing.—G. W. WARNER; 47, Chester Street, Leicester, September 13th, 1919.

EUVEANESSA ANTIOPA IN WARWICKSHIRE.—On October 3rd my friend Mr. A. Taylor twice saw a specimen of *Euvanessa antiopa*, near Warwick. He was unable to take it as he had no net, but saw

that the edges of the wings were very pale.—E. BOLTON KING; Balliol College, Oxford.

EUGONIA POLYCHLOROS IN DEVON.—The correspondent who, in the September number of the 'Entomologist,' records the capture of this butterfly at Paignton, may be interested to know that I have several times seen it whilst I resided there and collected in the neighbourhood. There is a locality for *polychloros*—long known to some people in the vicinity—about three miles from the town and not far from Barton Pines, beyond Higher Blagdon. It is a long country road, with trees each side of it, leading, I believe, to the village of Marldon. I have also seen *polychloros* in our garden, both on the wing and at rest. But with over twenty years' experience of South Devon in general, and the Paignton district in particular, I should say that the insect in question is decidedly scarce in those parts.—C. M. MAYOR; Dawlish, Devon.

POLYGONIA C-ALBUM IN WILTSHIRE.—I thought it might be of interest to readers of the 'Entomologist,' or for any private notes on distribution, to know of the capture of *Polygonia c-album* in my garden on September 15th. It is a specimen of the type form, and when I took it it was engaged in flitting from flower to flower among asters and Michaelmas daisies. Wiltshire figures among the counties referred to in South's 'British Butterflies' where this butterfly has been known to occur "sparingly or even singly," and it is certainly the first specimen which has been taken in this neighbourhood to my knowledge. I might mention that this is a particularly unfruitful district from the entomologist's point of view, being high and extensively cultivated, but this year I have found many insects quite abundant which I have never known to occur here in previous years. This applies chiefly to Diptera and Coleoptera.—W. J. ARKELL; Redlands Court, Highworth, Wilts.

POCOTA APIFORMIS IN BERKSHIRE.—A recent visit to the British Museum has convinced me of the advisability of recording for the possible use of Dipterists my capture at Wellington College, Berkshire, in June, 1918, of a large and perfect specimen of *Pocota apiformis*. The British Museum collection of Diptera contains three specimens, all of them rather smaller than mine and imperfectly set, two from the New Forest, and one from Shrewsbury. I understand that only very few other specimens are known, so that it would be interesting to learn if my locality is new. My specimen was found on a window, so I regret my inability to give any notes on the natural habits of the insect. I will only say that this corner of S.E. Berkshire is particularly well favoured by Diptera, and that I have taken there some of the nearest relatives of *Pocota apiformis* under the heading *Criorrhina*.—W. J. ARKELL.

CATOCALA NUPTA AB.—My young son, aged 12 years, while out sugaring for moths last evening at Beddington boxed a specimen of *C. nupta* whose hind wings are a dark brown, indeed, almost black, and without a trace of red about it. The fore wings are rather lighter than is usual, but more clearly marked.—W. ARTHUR LONG; 21, Guy Road, Beddington, Croydon, September 26th, 1919.

CURIOS ACCIDENT TO SPHINGID LARVÆ.—Two larvæ of *Chærocampæ theylia* were brought to me on July 22nd, 1919. I put them in a tobacco tin with some of the food-plant, and put the rest of the food-plant in a biscuit tin to keep it fresh. I forgot at the time that in the biscuit tin was some sawdust mixed with naphthaline, which I had prepared for preserving beetles. On taking some of the food-plant out of the tin I noticed that it had become blackened, and then remembered the naphthaline. Being unable to procure any more of the food-plant I picked out the freshest bits and put them in the tin with the larvæ at about 7 p.m. At about 1 a.m. next morning I returned from a dance, and found the two larvæ apparently lifeless. I put them into an ordinary breeding-cage, and on examining them next morning one of them showed signs of life, the other was apparently dead. At about 1 p.m. the first larva had climbed on to the side of the box, and the other showed signs of life. That evening I managed to get some more of the food-plant, and on giving it to them they both started feeding. I may add that they both turned to pupæ and later perfect moths hatched out.—F. B. SCOTT, Capt. I.A.; Shillong, Assam, August 29th, 1919.

NOTE ON *STAUROPUS FAGI* AND *SMERINTHUS OCELLATUS*.—Recently when keeping larvæ of *Stauropus fagi* and *Smerinthus ocellatus* in the same cage I found that *fagi* had left the beech and was feeding on sallow, although it eventually returned to beech again. But what was more remarkable was the fact that I watched *ocellatus* feeding on beech. Perhaps the fact that the latter was Ichneumonid accounted for its depraved taste.—ARTHUR BLISS; Heathercroft, Old Lodge Lane, Purley, Surrey.

AGRIADES CORYDON IN THE NEW FOREST.—Mr. Lucas's note on capturing *A. corydon* in the New Forest reminds me that I captured an odd specimen while collecting second-brood imagines of *argiolus* on August 8th. It was flying rather wildly in a ride on the Brockenhurst-Beaulieu road. I took specimens of the second brood of *A. bellarius* this year as late as September 20th near Salisbury. They were in good condition.—C. MELLOWS; Bishop's Stortford College.

AGROTIS SIMULANS IN OXFORDSHIRE.—On June 14th, while netting in our garden, I took a very fine specimen of *Agrotis simulans* (*pyrophila*). Has this insect been reported from Oxfordshire before, and is this not rather an early appearance?—MORRIS BOURNE; The Crossways, Shillingford (Oxon.), Wallingford.

PARYGEA MEGALIA, AND VESPA CRABRO IN ESSEX.—Referring to Mr. Lucas's remarks on these species in the New Forest (pp. 237-8), I should like to record that the former was very common in the Chignal district on August 23rd last, whilst the latter, which is generally common, was not so common as usual, I understand.—C. NICHOLSON; Hale End, Chingford.

VESPA CRABRO.—A flourishing colony of *Vespa crabro* took up their residence in July this year in an outhouse next my garden and soon made themselves a terror to the local bee-hives. Recalling Virgil's familiar lines to a bee-keeper, "Aut asper crabro inparibus se immiscuit armis," it was an interesting sight to watch the

marauders at work. They made no attempt to enter the hive, but hovered above it and swooped down on the alighting board to carry off honey-laden worker-bees. The head was at once bitten off and the rest of the bee carried to a neighbouring plum tree and devoured at leisure. Under one hive we found quite a little pile of bee's heads. The nest was not difficult to secure, the hornets—200 in number—being rapidly overcome by a few pieces of potassium cyanide in a bucket held over it. It is a specimen of unusual beauty.—C. MELLOWS; Bishop's Stortford College.

THE DRUCE COLLECTION OF LYCAENIDÆ AND HESPERIIDÆ.—This well-known and important collection has recently come into the possession of Mr. J. J. Joicey and is now at the Hill Museum, Witley. This collection was made by Mr. Hamilton H. Druce, who is well known as one of our authorities on the Lycaenidae and Hesperiidae. A great many types of species described by Mr. Druce as well as many of the types of Semper are contained in the collection. Entomologists desirous of comparing any specimens in this collection are invited to write to the Curator, The Hill Museum, Witley, Surrey.

ERRATUM.—Page 201, line 5, for “hind wing” read “hind margin.”

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*July 10th, 1919.*—Mr. Stanley Edwards, F.L.S., President, in the Chair.—Mr. Moore exhibited *Pyrameis atalanta* from Dunedin, Florida.—Mr. Sperring, a series of suffused specimens of *Brenthis euphrosyne* from Lincolnshire, a bred series of *Mimas tiliae*, including ab. *centripuncta*, ab. *suffusa*, and other forms from Blackheath.—Mr. Barnett, a large locust sent from Gibraltar alive.—Mr. Coppard, several of the larger British sawflies.—Mr. B. S. Williams, aberrations of *Pieris rapæ*.—Mr. Humphries, larvae of *Limantria dispar* from Holland, larvae of the Solomon-seal sawfly and aberrations of *Aglaia urticæ* and *Vanessa io*.—Dr. Robertson, short series of New Forest “pugs,” *Eupithecia*, and a fine series of *Cleora glabrataria* bred from New Forest larvae, including one with a minimum of marking bred from a perfectly black larva.—Mr. Edwards, *Papilio* species from South America of the *Ascanius* group.—Remarks were made on the scarcity of Butterflies this season.

July 24th.—Mr. Stanley Edwards, F.L.S., President, in the Chair.—Mr. Sperring exhibited aberrations of (1) *Brenthis euphrosyne* with spots coalesced to form solid lines; (2) *Pararge aegeria*, underside with primrose markings and extended central blotch, another very dark suffused underside; (3) *Amorpha populi*, very dark unicolorous specimen, and a series with wide aberration in banding and in colour.—Mr. West, the beetles *Onthophagus taurus* from Malta and Gibraltar and *O. nutans* from Epping Forest.—Mr. Main, living glow-worms from Delamere and the Isle of Wight, the former only half the size of the latter.—Mr. Ash, a *Sirex gigas* taken in the Strand.—Mr. Edwards, species of *Papilio* from South America of the *protesilaus* section.—Mr. Carr, pupa cases of *Thecla w-album*, *in situ* on the undersides of the leaves of wych elm.

August 14th.—The President, Mr. Stanley Edwards, F.L.S., in the Chair. The death of Lieut. F. H. Woolley-Dodd, F.E.S., in the Dardanelles was announced. Mr. Blair exhibited black aberrations of *Catocala aurata* from St. Mary's, Scilly.—Mr. Turner, a series of large and bright *Euphydryas jurtina*, race *hispanula*, from the plains of Catania, Sicily, and a long series of *Adscita geryon* from near Tring, Herts, where it had been very plentiful this season.—Mr. Buckstone, (1) *Baccha cruentaria* from the New Forest; (2) *Tenioecampa munda*, bred and captured Oxshott, Wimbledon, etc.; (3) *Adopaea flava* (*thaeonis*), a dark ♀ taken at Boxhill on August 18th; (4) *Aphantopus hyperanthus*, under sides showing gradation in colour and spotting, including ab. *areata*; (5) larvae of *Cosymbia pendularia* from bred females of a brood of which some pupæ appeared to be going over; and (6) he reported that seven out of ten pupæ of *Tephrosia luridata* were apparently going over.—Mr. Bennett, specimens of *Aeronicta leporina* and *Hylorhila prasinana* from Chislehurst. Remarks on the season showed that Noctuae were scarce, sugaring was a failure, honeydew had been very detrimental to larvae, that a late frost had probably affected *Ariades corydon* badly, and that white butterflies and *Polyommatus icarus* were also scarce.

August 25th.—Mr. Stanley Edwards, F.L.S., President, in the Chair.—Mr. B. S. Williams exhibited *Hibernia marginaria* (*pro gemmata*), typical from Yeovil, ab. *fuscata* from Finchley and St. Anne's-on-Sea, with intermediate forms.—Mr. Newman, a fine bred ab. *walkeri* of *Spirosoma menthastrum* from Bexley.—Mr. H. J. Turner, for Mr. Greer, of Co. Tyrone, a long series of *Hydracia erianensis* taken at honey-dew on thistles, and a pair of *Epinephele jurtina* ab. *addenda* which appears to be a local race in Co. Tyrone.—Mr. Ashdown, a rare beetle, *Opilo mollis*, also *Gracilia minuta*, and stated that one of the specimens was the smallest longicorn he had ever seen. All were from Surrey.—Mr. Sperring, soft grey forms of *Bournia repandata* from Scotland, *Ariades corydon*, males, with much black suffusion, a *striata-obsolete* form, and a varied series of *Colias urticae*, Paisley.—Mr. Johnston, several examples of *Limenitis sibylla*, almost completely black, and aberrations of *Dryas paphia*, with very considerable coalescence and elongation of the usual markings.—Mr. Bennett, a larva of *Aeronicta leporina* feeding on oak.—Mr. Edwards, *Papilio protodamas* (*hyperion*), *P. phaon* ab. *ubpas*, and *P. philenor* ab. *acanda* from S. America.—Reports of the season were made by several Members.

September 11th.—The President, Mr. Stanley Edwards, F.L.S., in the Chair. Mr. H. J. Turner exhibited *Colias clusa* ab. *helicina* (clear lemon coloured) from Cyprus, and three bred specimens of the very local Noctuid *Triodontula incanustus* from Catania, Sicily, with notes.

September 25th.—The President in the Chair.—Lantern-slides were exhibited by Messrs. Lucas, Bennett, and Dennis.—Mr. Step, for Mr. Miles, an Atlas Moth, 11 in. in expance, from India.—Mr. Turner, *Hesperia* from Cordoba, Argentine, including *Hesperia americana*.—Mr. Ashdown, a book of coloured drawings of flowers and a beautifully worked Japanese metal leaf with a fly, a minute tortoise, and a snail upon it, all finely chased.—Mr. B. S. Williams, a melanistic series of *Bournia repandata* from Finchley.—Dr. Chapman, some galis on dogwood.—*Hy. J. TURNER, Hon. Editor of Proceedings.*

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EREbia AETHIOPS AT ARNSIDE.

By H. ROWLAND BROWN, M.A., F.E.S.

A SPECIAL interest attaches to *Erebia aethiops* in its Arnside (Westmorland) locality. At this point it reaches its southern limit in the north west of our islands. I was, therefore, particularly glad to have an opportunity of observing *aethiops* in this one of its English haunts when I was transferred to Liverpool for two or three weeks at the beginning of August last, and still more so when my friend, Mr. C. F. Johnson, of Heaton Mersey, decided to accompany me for the week-end, August 8th-10th. The Lancashire holiday was just beginning and the congestion on the railways oppressive, but once out of the train the peace and sunshine of Arnside completely restored us to equanimity, and having disposed of our modest baggage at the Crown Hotel, piloted by Mr. A. E. Wright, who had kindly come over from Grange for the purpose, we were taken at once to the ground. A more exquisite landscape it is impossible to imagine, and the limestone hills, a blaze of chrome ragwort against an Italian blue sky, presented a picture of never-to-be-forgotten beauty. I was surprised to hear from my companion that our *Erebia*, once so common at Grange-on-Sands, across the estuary of the Kent river, had completely disappeared therefrom, with *Leptosia sinapis*. The why and wherefore of this strange departure is inexplicable, but in accordance with experiences of other vanished or vanishing species in Britain it appears to be due to natural causes rather than the indiscriminate assaults of the collector. In such cases there is always the hope that some day or other the species will reassert itself, as we have seen certain species have returned to their former localities after, it may be, an absence of even a century. May it be so in north Lancashire with *Erebia aethiops*, no longer, also, a denizen of Witherslack.

As a matter of fact we were just a week too late to find our butterfly in perfection—the majority of the males netted were decidedly *passés*, the females, some of them, already beginning to show signs of wear and particularly tear, for *aethiops* has the habit of flying into thorn and bramble when alarmed—and

incidentally is extremely local, though common enough where it occurs. We had no time to pursue our investigations much beyond the bracken-covered hill-sides at the point indicated. I was rather surprised at the number on the wing thereabouts. Half a dozen nets had been at work in the last two days, but there were quite enough left not only to satisfy our requirements but to ensure the continuity of the race. I rather fancy some of the collectors had not discovered the actual metropolis. Butterflies generally, if limited in number of species, made up by abundance of individuals. *Argynnis cydippe* females were still in evidence on the thistles, but they also had seen their best days. The woods were full of worn *Zephyrus quercus* of both sexes, but I do not remember to have seen a single member of the "Blues," though, of course, we were in full sight at certain spots of the headquarters of *Aricia medon salmacis*, and of Meantrop Moss across the water, where even so late in the season Dr. Keynes was taking fresh ♀ *Plebeius argus (egeon) masseyi*. On the *aethiops* ground *Hipparchia semele* was in rags, *Gonepteryx rhamni* was just coming out, and a few males of *Aglaia urticae* were on the wing.

The Arnside race is characteristic in comparison with the *aethiops* of the Continent, but I do not find any constant superficial differences in size, coloration of the rusty band, or the number and size of ocellations in the males when placed side by side with Scots examples. The species must, I think, reach its finest development in the hot valleys of what was formerly Hungary, and is now Rumania—Mehadia and Herkulesbad for example. My short series of males from the latter locality show it is the largest of all the Erebias except *E. ligea*, to which it is closely correlated—even as large as *E. palarica*, Chpm.—and my only regret is that when I was on the Danube in 1912 the females had not yet begun to emerge. Our English *aethiops* seem to me to come nearest to the higher alpine and mountain forms we find, e. g., in the Val d'Anniviers up to 5000 ft., so far as the brilliancy of their coloration is concerned. The Swiss examples are certainly larger than the run of those from Arnside and Scotland that I have seen in Mr. Johnson's and my own cabinets. At the level of Neuchatel (about 1450 ft.) I found examples of a then much-worn emergence from August 26th to the 29th, 1898, except in the size of the fore-wing ocellations on the females also differing little from our Westmorland race. *Inter se* it may be said of the Arnside *aethiops* that in both sexes hardly two are alike; in some males the rusty band of the fore wings is hardly constricted at all, in others the characteristic constriction is exaggerated, while the ocellated black spots vary infinitely in size, as well as more occasionally in number. I secured one or two brilliant females, but unfortunately a long period had to elapse before I set out my specimens, and not a few suffered in

the packing. Mr. Wright informs me that the surrounding district is especially good for Crambidae. During week-ends in July and early August he had taken the following: *Crambus falcellus*, *C. pratellus*, *C. pascuellus*, *C. uliginosellus* (Mr. Mansbridge took the first, which is new to North Lancashire and Westmorland lists), *C. margaritellus*, *C. pinellus*, *C. perlellus* and var. *warringtonellus*, *C. tristellus*, *C. inquinatellus*, *C. geniculeus*, *C. culmellus* and *C. hortuellus*. The only Crambites netted on August 8th were *C. tristellus* and *C. inquinatellus*.

October 14th, 1919.

NEW SPECIES OF PYRALIDÆ FROM FORMOSA.

By A. E. WILEMAN AND RICHARD SOUTH.

(Concluded from vol. li, p. 219.)

Mastigophorus bilineata, sp. n.

Palpi very long, outer half with long hairs. Antennæ with short bristles. Fore wings dark-brown, clouded with blackish; antemedial and postmedial lines ochreous-white, the former almost straight and the latter inwardly oblique; subterminal line wavy, most distinct towards costa, where it is ochreous-white, inwardly bordered with black; two pale-ringed black spots in the cell between the transverse lines; a series of black triangles on termen. Hind wings smoky grey, paler on costal area, a pale transverse line beyond middle. Underside grey; fore wings suffused with fuliginous, except on dorsal area, two pale marks on apical third of costa; hind wings stippled with fuliginous, two black spots in the cell and a waved line beyond.

Expanse, 40 mm. ♂, 38 mm. ♀.

Two males and two females, Arizan, Formosa, August, 1908. Comes near *M. brevivittalis*, Moore.

Nephopteryx ochridorsalis, sp. n.

♂. Fore wings greyish, with faint brownish tinge, inclining to blackish on the terminal neuration, dorsal area ochreous, dashes between the veins before termen ochreous; hind wings fuscous grey, veins darker.

♀. Wings rather broader than the male and the ochreous colour between the veins on terminal area of fore wings rather more pronounced.

Expanse, ♂ 28 mm., ♀ 30 mm.

Collection numbers, 1728 ♀, 1729 ♂.

One example of each sex from Rantaizan, the female taken on May 8th, 1919, and the male on May 9th of the same year.

Phycita griseofusa, sp. n.

Head, thorax and abdomen grey. Fore wing grey, freckled with darker; postmedial line black, inwardly edged with white, slightly

sinuous, preceded on dorsum by a black or blackish spot, followed by a brownish-grey band; subterminal line brownish-grey, double, serrate, enclosed space white; terminal dots black. Hind wings white, silky, margins suffused with grey. Underside fuscous on the fore wings, hind wings as above.

Expanse, 22 mm.

Collection numbers, 399 and 400.

Three specimens from Takow, August 6th, 1904.

In one of the specimens the dorsal spot is brownish-grey, and in the specimen with a black dorsal spot the basal third is brownish-grey.

Comes near *P. unbratalis*, Hampson.

Phycita taiwanella, sp. n.

♂. Head, thorax and abdomen grey mottled with brown. Fore wings grey mottled with brown; antemedial line black inwardly edged with white, slightly waved, preceded by a central brown spot which is inwardly edged with black; subterminal line white, wavy, edged by brown marks on the veins; black dots on termen; fringes greyish white. Hind wings whitish, terminal line brown. Underside of fore wings brownish; hind wings as above.

Expanse, 22 mm.

One male from Takow, August 2nd, 1904.

Near *P. griseofusa*.

Scoparia promiscua, sp. n.

♂. Head and thorax brownish-grey, abdomen rather darker, paler on terminal segments. Fore wings brownish-grey sprinkled with black, antemedial line blackish, only distinct on dorsum; subterminal line blackish, outwardly edged with whitish, indented below costa, thence inwardly oblique to dorsum; claviform stigma black, orbicular outlined in black and connected by black scales with the black X mark; black marks on termen and on the whitish fringes. Hind wings white, rather silky.

Expanse, 23 mm.

Collection number, 1124a.

Arizan (7500 ft.), September 22nd, 1906.

Comes nearest to *S. angustea*, Stephens.

NEW SPECIES OF LITHOSIADÆ AND NOLIDÆ FROM
THE PHILIPPINES.

By A. E. WILEMAN AND RICHARD SOUTH.

(Concluded from p. 51.)

Asura punctilinata, sp. n.

Head and thorax pale buff, the latter with two black dots; abdomen whitish buff, darker on terminal segments; fore wings pale buff, with black markings as follows: a dot at base towards the costa, an

inwardly oblique series of four dots, a sinuous thick line preceded above dorsum by a dot and followed by a dot below costa, a series of ten dots before tornus of which the fifth to eighth are elongate, a series of dots on the tornus. Hind wings whitish. Underside whitish-buff, with black markings showing faintly on the fore wings.

Expanse, ♂ 20 mm., ♀ 22 mm.

One example of each sex from Palali, subprov. Benguet, Luzon (2000 ft.), December 26th, 1912.

Near *A. atritermina*, Hampson.

Asura inornata, sp. n.

♂. Head and thorax pinkish-buff; abdomen slightly paler. Fore wings pinkish-buff. Hind wings paler, inclining to greyish on discal area. Underside of fore wings pinkish-buff on margins, blackish on discal area; hind wings as on upper side.

♀. Paler buff, otherwise agreeing with male.

Expanse, ♂ 20 mm., ♀ 24 mm.

Male type from Kolambungan, subprov. Lanao, Mindanao (sea-level), May 26th, 1914; another male, in poor condition, from Sapiangao, subprov. Benguet, Luzon (5500 ft.), December 15th, 1912. Five female specimens, one each from Kolambungan and Sapiangao, the others from Palali, subprov. Benguet, Luzon (2000 ft.), December 23rd, 1912.

Comes near *A. melanopyga*, Hampson.

Asura (?) ocellata, sp. n.

Head and collar white, flecked with grey-brown; thorax grey-brown; abdomen white, flecked with grey-brown. Fore wings white, with grey-brown markings placed as follows: a blotch at base of costa, antemedial and medial lines joining about middle, postmedial line strongly excurred about middle and enclosing a large black-centred spot, a tridentate subterminal line; fringes grey-brown. Hind wings white, terminal line grey-brown. Underside similar to upperside, but markings of fore wings rather confused.

Expanse, 28 mm.

Three males from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), December, 1912.

Near *A. hilaris*, Walk.

Miltochrista nigripuncta, sp. n.

Head and thorax white, marked with sandy brown; abdomen sandy brown, mixed with white towards thorax. Fore wings white with sandy brown markings, comprising a patch about middle of the base, followed by an incurved line; postmedial and subterminal bands, both interrupted. Discoidal dot blackish. Hind wings white. Underside as above, but markings faint. Female without blackish discal dot.

Expanse, 18 mm.

One example of each sex, in poor condition, from Kolambungan, subprov. Lanao, Mindanao, May 25th ♂, 26th ♀, 1914; taken at sea level.

Comes near *M. vafilinea*, Walk.

Miltochrista unilinea, sp. n.

Head white, thorax white marked with pale brown; abdomen brownish, mixed with white towards thorax. Fore wings white, a pale brown spot on costa at base, similar spots on costa and dorsum representing an antemedial band; postmedial line pale brown, sinuous, commencing in a spot on costa and terminating in a smaller spot on dorsum, a pale brown spot in costal sinus and another in dorsal sinus; a series of pale brown elongate marks on the terminal area; terminal line pale brown.

Similar to the male, but the terminal markings of fore wings are four in number and very distinct, and there is a pale brownish cloud at apex of the hind wings.

Expanse, ♂ 22 mm., ♀ 25 mm.

Male specimen from Palali, subprov. Benguet, Luzon (2000 ft.), December 26th, 1912; female from Kolambungan, subprov. Lanao, Mindanao (sea-level), May 30th, 1914.

Pisara punctilinea, sp. n.

Head and thorax greyish-white, the latter marked with brown; abdomen brownish-grey, brown at anus. Fore wings greyish-white, sparsely powdered with blackish, slightly tinged with brown at base; antemedial line represented by fuscous dots only distinct towards costa, preceded by two fuscous dots on the costa; postmedial line fuscous, sinuous, inwardly angled above dorsum, dotted with black at angle and above angle and costa; subterminal line fuscous, sinuous, angled above middle, some black scales on it towards dorsum; termen more thickly powdered with blackish and dotted with black; fringes white, dotted fuscous. Hind wings fuscous with darker discal dot. Underside fuscous, paler on dorsum of each wing.

Expanse, 16 mm.

One example from Kolambungan, subprov. Lanao, Mindanao (sea-level), May, 1914.

Allied to *Pisara thyrophora*, Hampson, from Formosa.

Nola tincta, sp. n.

Head and thorax white, mixed with grey-brown; abdomen grey-brown. Fore wings whitish, powdered with brownish, a faint pinkish tinge on basal half; antemedial line blackish, broadly serrate, darker dots on it towards and on the costa; postmedial line blackish, dotted with black, excurved about middle and slightly incurved above dorsum; subterminal line blackish, sinuous, diffuse; terminal dots black; fringes pale grey, chequered with darker. Hind wings undorside fuscous.

Expanse, 20 mm.

A female specimen from Kolambungan, subprov. Lanao, Mindanao (sea-level), May 15th, 1914.

Celama curvilinea, sp. n.

♂. Head and thorax white, mixed with pale brown; abdomen grey-brown, whitish towards thorax. Fore wings white, marked with pale brown at base, chiefly on costal area: antemedial line black, edged with pale brown on the costa, slightly incurved; postmedial line dark brown, flecked with black, irregular, double, preceded on the costa by a brown spot, subterminal line dark brown, flecked with black; terminal line pale brown. Hind wings whitish, powdered with fuscous, especially on terminal area. Underside white, neuration of fore wings fuscous, costal area of hind wings sprinkled with fuscous Expanse, 15 mm.

Taken on May 25th, 1914, at Kolambugan, subprov. Lanao, Mindanao (sea-level).

Comes near *C. tumulifera*, Hampson, from Ceylon.

THE EARLIER STAGES OF *PERONEA MACCANA*, TR.,
P. LIPSIANA, SCHIFF, P. RUFANA, SCHIFF, AND
P. SCHALLERIANA, L.

By W. G. SHELDON, F.Z.S., F.E.S.

(Concluded from p. 255.)

P. rufana, Schiff.

During the last week in July, when almost all of the *P. maccana* larvæ had disappeared, those of *P. rufana* began to be fairly common on *M. gale*, and a few were found on sallow also. These larvæ, so far as my experience went, were very local, for I could only find them in the vicinity of Camghouran Burn, although I searched *M. gale* in many other spots.

The following is a description of a full-grown larva which I made on July 29th: 15 mm. long, of average stoutness, tapering to each extremity; head blackish-brown with black blotches; prothoracic plate black; in the spiracular region of the prothorax is a glabrous black spot on each side. Both head and prothorax are highly glabrous; anal plate light green and glabrous; the segments at the rear of the prothorax are in the dorsal area dull smoky-green, and in the ventral portions and the claspers a paler shade of the same tint; the prolegs and feet are black and shining; the tubercles and spiracles are inconspicuous. The larva spins together shoots of *M. gale* and lives within the chamber thus formed; it is very similar in all the instars, the only difference that I noticed being that the head of the small larva is jet black.

Pupa.—The pupa is very similar to that of *P. lipsiana* previously described, and agrees with it in all respects, so far as I can see, with the exception that the wing-cases are smooth and not striated; they reach to the centre only of the fifth abdominal segment and not to the rear of it; the abdominal

segments are without the green tinge that is found in *P. lipsiana*, and the points of the rows of spikelets are more pronounced than in that species.

Out of some five or six dozen larvae obtained, only twelve imagines emerged between August 24th and September 16th. There is one point about this species which is at present unknown, and that is whether it deposits its ova in the autumn or hibernates and deposits them in the spring. So far as I am aware no one has seen a specimen after hibernation.

P. schalleriana, L.

Ova.—The ova is horizontal; it is oval in shape. The surface is glabrous and slightly opalescent, greenish-grey in tint; it is divided into a large number of irregularly shaped cells by slightly raised ribs. These cells vary much in shape: those near the base are opened out much more than those in the centre and towards the micropyle; the sides of these cells are all sinuous in outline and not straight, as is the case in many *Tortrix* ova. Through the envelope of the ova is seen, not very distinctly, a nucleus which is buff coloured: the diameter of this nucleus is about .4 mm. by .3 mm. The size of the outer envelope is about .67 mm. by .55 mm.; the height of the ova is about .15 mm.

This ova was deposited on August 26th, 1917, on the stem of a spray of blackthorn, at the base of a bud; others were deposited in a similar position on a spray of whitethorn.

The ova were examined on November 18th, 1917; the nucleus was now orange in colour, and the ova resembled the orange nodules which are abundant on the stems of blackthorn; the diameter of the nucleus had increased and was then about .55 mm. by .34 mm.: the outer envelope was quite colourless and very transparent, the nucleus had a well-defined outline and showed up very distinctly.

Larva.—A larva emerged April 23rd, 1918, length about .7 mm.; head intensely black, spiny and glabrous; prothoracic plate fuscous; segments at rear of prothorax pale green, glabrous, tubercles not prominent, prolegs darker than the prothorax.

The larva feeds in this instar by burrowing into a sloe leaf from the upper side, forming a chamber in the leaf and feeding therein. On May 1st the larva was in its second instar; it was then 1.15 mm. long; it was similar in all respects except size to the first instar. The third instar was reached on May 8th, the larva being then 4 mm. long; it lived in a web on the underside of a leaf, forming a dwelling between two of the main veins of the leaf; this leaf had been placed upon another leaf, and the larva fed upon the lower cuticle of the upper and the upper cuticle of the lower leaf. The head and prothorax were jet black and glabrous; the division between the two was distinct and of the colour of the segments at the rear of the prothorax, i. e. light green; the

tuberles were not prominent. In the previous instars it was sluggish, but in this it was more active, moving about briskly inside its chamber when irritated.

The larva reached the fourth instar on May 15th, and was then 8·5 mm. long; head dark greenish-brown and glabrous; prothorax, in dorsal region light green, in spiracular region brownish-black, distinctly darker than the head; the green dorsal area at the rear of this segment occupies the whole of it, in front it narrows to a point. The prolegs, feet and claspers are green of the same tint as the segments at the rear of the prothorax. The larva still fed between two leaves without making any effort to roll either of them. On May 20th it was in the fifth and final instar. It was now 9 mm. long; the head was pale amber-coloured and glabrous; around the mouth it was reddish-brown; on each side of the mouth was a brownish-black blotch; the prothorax was greyish-green of the same tint as the segments behind it; on each side, in the spiracular region, was a triangular brownish-black blotch. The segments behind the prothorax were dull olive colour in the dorsal area, light greenish-grey in the subdorsal, very transparent, the anal canal showing distinctly; the prolegs, feet and claspers were the same grey as the subdorsal area; the tubercles were not prominent, and of the same colour as the surrounding area; spiracles very inconspicuous. On May 17th the larva was about 14 mm. long and full fed; the colour was light apple-green, otherwise, as previously described in this instar, there was no sign of anal plate in any instar. It was now active, wriggling violently when ejected from its retreat; it lived between two plum-leaves, eating entirely through the lower leaf, and forming a large, irregularly-shaped cavity in it; on June 3rd it had pupated.

Pupa.—The pupa is 7 mm. long by 1·85 mm. broad. The head, thorax and wing-cases are greenish-buff, smooth, and glabrous; the head is rounded, without trace of a pupa opener; the wing-cases reach to the centre of the fifth abdominal segment; the abdominal segments are reddish-brown and slightly glabrous. Each segment has a row of spikelets on the dorsum which point backwards. The pupa stage lasts about three weeks.

The moths which were responsible for the ova and larvæ described above were obtained in Surrey, but the pupa was described from one which was found in the Black Wood at Rannoch.

The larvæ of *P. schalleriana* appears to be a pretty general feeder; I have reared it here on blackthorn, plum, and white-thorn, whilst at Rannoch I found quite a number on *Vaccinium myrtillus* and *V. vitis idea*. Machin, according to Barrett, found it in numbers feeding upon osier.

As to whether *P. comparana* is merely a form of *P. schalleriana*, the question can only be settled by breeding both from the ova of one female, but from some two dozen larvæ obtained

at Rannoch, all of which, so far as I could see, were absolutely identical in appearance (and the larva of *P. schalleriana* is for a *Tortrix* a very striking one, not easily mistakeable), I reared eight *P. schalleriana* and three *P. comparana*; this seems to leave very little doubt as to the two being forms of one species.

In the foregoing descriptions of larvae and in those of other species of Tortrices which I have previously made I have not given any details of tubercular and spiracular arrangement. There is, of course, considerable diversity in those in certain groups of Lepidoptera, and these differences are valuable for purposes of classification and otherwise, but in the Tortrices the different species and groups of species are structurally very much alike in these organs, and having been unable to detect any differences that are likely to be of value I have omitted all mention of their structure, which is perhaps preferable to making minute descriptions, confusing as these often are.

The larvae of all four species here described pupated in confinement in chambers formed by spinning together a flap of a leaf of their food-plant or by forming the chamber by spinning together two leaves: but I did not find a single pupa on the food-plants, and there is no doubt but that in a state of nature the larvae usually wander away from them and pupate elsewhere.

In collecting the various *Peronae* larvae found upon *Myrica* and *Vaccinium* at Rannoch I carefully examined each one in my lodgings and kept the different descriptions separate in tins; the result was that I saw at once that the great bulk of them consisted of four species, and when they emerged all of these resolved themselves into the four species mentioned in this paper. Not a single imagine of any species appeared in more than one tin, from which it will be understood that the larvae are easily distinguished from each other. In each tin, however, were a very few pupæ which have not yet emerged, and which no doubt will not do so this year. I shall be curious to ascertain what species they produce.

I gathered a number of *P. hastiana* larvae from sallow; amongst these were several with black heads, and from this lot I bred two examples of *P. rufana*; no doubt they came from the black-headed larvae.

You may, South Croydon;
October 2nd, 1919.

NOTES AND OBSERVATIONS.

PSELAPHORUS BRACHYDACTYLUS IN GLOUCESTERSHIRE.—Since the discovery of this rare Plume moth in the Stroud district it has been my ambition to find a locality for it near Gloucester. This desire was stimulated by the refusal of the Stroud collectors to show me its habitat. Thanks to the kindness of Mr. A. B. Farn, of Ganarew, at whose house I have spent several happy days going through his

unrivalled collection of varieties, I have this season found the species early in July in some numbers in one very restricted locality about two hundred yards from the place where Mr. Farn took one specimen in 1894. Like all great discoveries it was purely accidental, for at the moment I was pursuing my unavailing search for the Red Helleborine (*Cephalanthera rubra*). Most of them were in fine condition, but it is a species which soon loses the brilliant blackness of the markings, which wore off to a dirty brown. The spot was almost barren, only one very small plant of *Lactuca muralis* being noticed in the neighbourhood, so that this can hardly be its food-plant, but I must hold over the details for further investigation. It has been a great pleasure to me to supply some of our leading entomologists with specimens.—C. GRANVILLE CLUTTERBUCK; 23, Heathville Road, Gloucester, November 15th, 1919.

THE SYDNEY WEBB COLLECTION.—In an obituary of the late Sydney Webb in this magazine (ante, p. 119), we read—"probably there is no finer private collection of native Lepidoptera in the United Kingdom than that made by the deceased gentleman. It includes magnificent series of varieties and aberrations, many of which have been figured and described in contemporary works on the subject, the result of his own indefatigable labours, coupled with those of Bond and Gregson, whose entire cabinets at their death were embodied with his own." And even beyond this, as a glance at the catalogue shows, many other well-known collections had, from time to time as they were dispersed, been freely dipped into, such names as Marshall, Briggs, Gill, Mason, Harper, Hopley, Vaughan, Stevens and Desvignes frequently appearing as the collections from which specimens had been obtained. Many of these men, it will be remembered, were active collectors at the time when *Chrysophanus dispar* was wont to disport itself in the fenlands of this country, and other of our now "extinct species" were of common occurrence. Little wonder therefore that when the first portion of this remarkable collection was offered at auction at Stevens' Rooms on October 21st it attracted more than usual attention, and competition for some of the more noteworthy specimens was keen, many lots bringing record prices, yet, as is so often the case, some others that appeared to be interesting were little sought after. Thus the highest price obtained for any one *Papilio machaon*, an unusually dark example with broad bands, was £2. Sundry lots of *Aporia crataegi* in which were included more or less remarkable aberrations made from £1 to £3 15s., of *Pieris brassicæ* from 20s. to 50s., of *P. rapæ* 6s. to 45s., and *P. napi* 10s. to 30s. per lot. The highest price obtained for any one *Euchloë cardamines*, a very remarkable specimen, was £6, while three gynandromorphs sold at £4, £4 10s. and £5 each. The best two *Gonepteryx rhamni*, male and female colouring appearing in each specimen, sold for £7 7s. and £7 10s. each, and one with right side male and left female for £9, a "rayed u.s." *Colias edusa* for £5 and one with right side male and left female for £9. A very pale *Melanargia galatea* brought £8 10s.; a nearly unicolorous light *Pararge aegeria* £5; a similar form of *P. megera* £4 4s., and one almost entirely dark brown £3 10s. Two *Apatura iris* with white bands almost obliterated ran up to £5 10s. and £6 10s. respectively and two others with markings almost

obliterated to £10 10s. and £16 16s., while an entirely black *Limenitis sibylla* made £6. Two good aberrations of *Pyrameis cardui* sold at £7 each; several *Vanessa io*, remarkable chiefly for modifications of the ocelli, ranged from 10s. to £11, and one in which the ocelli were greenish touched £12 12s., while the best of the *Aglais urticae* ran up to £6, £7, £11 and even to £18, this last price being obtained for a noteworthy light variety. If price may be taken as a criterion of merit the Argynnids were the outstanding feature of the collection, an almost entirely "obscured" specimen of *Argynnis cydippe* fetching the record price of £22, while others of a similar but less pronounced form made £17, £14 and £11. Diffused and rayed *A. paphia* brought £7 and £7 7s., and a very pale specimen £9, while £4 and £8 were paid for streaked and heavily marked *A. aglaja*. Of *Brenthis euphrosyne* cream and yellow forms went for 2 to 3 guineas apiece and the more curiously marked forms at anything from £3 10s. to £11 11s., while the best of the *B. selene* sold between £4 and £8, but one almost entirely black both on upper and underside ran up to £21. Among the "rare" species *Pontia daplidice* ranged from 16s. for three to 45s. for a fine male; *Euvanessa antiopa* from 10s. to 60s.; *Issoria lathonia* from 10s. to 50s., and *Chrysophanus dispar*, of which fifteen specimens were offered, from £1 10s. to £12 10s. each, and a "pupa case" of this species made £5. The day's sale produced a total of just over £900, and we understand that the second portion of the collection will be offered on Tuesday, December 9th.—R. A.

THE MITFORD COLLECTION.—This collection of British Rhopalocera came under the hammer on November 11th. It also was rich in aberrational forms, and many of the more interesting lots again found buyers at distinctly high prices. An underside *Argynnis cydippe*, in which the silver spots appeared to be collected together into large basal patches, made £11 0s. 6d. Various suffused forms of *D. paphia* sold at £2 5s., £3, £3 5s., £4 and £6 each. A remarkable form of *Melitaea athalia*, with the markings so diffused as to give the appearance of a brown insect with a tawny band, ran up to £12, but a cream-coloured *Brenthis selene* made only £2, and two darkly-banded *B. euphrosyne* £2 7s. 6d. the lot. *Aglais urticae*, without blue spots in the hind wings, brought £4 10s. *Limenitis sibylla*, with bands more or less obsolete, of which some half-dozen specimens were offered, ranged from 30s. to three guineas apiece. Three similar forms of *Apatura iris* brought 21s. where the white bands were narrowed, £3 10s. where they were obscured in hind wings, and £16 where obsolete, while for a fine female with the outer half of hind wings pale £5 10s. was obtained. An unusually good example of a rayed underside of *Polyommatus icarus* made £5 10s.; *Lycia ethonia* sold at from 24s. for one to 28s. and 37s. 6d. per lot of two; *Euchloe st. antonii* at from 11s. to 30s. each, *Chrysophanus dispar* from £5 to £7 10s. per specimen, and one lot of 20 Devonshire *Liaxma orion* ran up to 50s. R. A.

SCIAPTERON TABANIFORMIS. A specimen of this rare clearwing was taken on a poplar trunk close to Portsmouth in July, 1909. Owing to my then ignorance of its value it was not recorded at the time. On the advice of my friend Mr. F. C. Woodforde, who has seen the

specimen, I am now making this tardy record. Although I have looked out for a second specimen, none has yet come to hand. The district abounds in well-grown poplars.—A. E. BURRAS; 3, Connaught Road, N. End, Portsmouth.

HIPPOTION CELERIO AND OTHER LEPIDOPTERA IN THE MAIDSTONE MUSEUM.—By the courtesy of the Assistant Curator I was shown a drawer of lepidoptera containing some interesting examples of the rarer Kent lepidoptera when I paid a visit to the beautiful Maidstone Museum this month. The neighbourhood does not appear to have been worked systematically by local collectors of recent years, but from the few opportunities I had to make acquaintance with the surrounding country I should think it affords a rich field for exploration. The "County Collection" is mostly made up of old captures—some in a very dilapidated condition. Except in a few instances the labels in this cabinet are printed "Kent" only. But there are two obviously hibernated examples of *Euvanessa antiopa* taken at Maidstone in February, 1889. In the special drawer I found a third of more recent capture, which is, however, under suspicion as an escape. Other contents are a small series of *Leptosia sinapis* labelled "Wateringbury, R. H. Fremlin, 1857," and a pair of *Melitaea athalia*, June, 1907, taken by Mr. Best. The rarer Heterocora are represented by a fine series of *Manduca atropos* and *Agrius convolvuli* from the Maidstone district, and two very fine *Hippotion celerio* (neither, I believe, recorded), one taken quite close to the Museum by Mr. Webb on November 4th, 1903, the other at Teston by Mr. Page on October 6th, 1913. There is also a short series of bred *Ægeria andrenæformis* with larva and pupa shown *in situ* in a section of *Viburnum lantana*.—H. ROWLAND-BROWN; October 10th, 1919.

SCARCITY OF AGLAIS URTICEÆ.—It is very curious to note the scarcity of this common butterfly in many of its southern haunts this season, especially when the abundance of hibernated individuals is remembered, as recorded in notes of mine and other observers in this magazine (*antea*, pp. 68, 89, 137). It has been conspicuous only by its absence in our North Middlesex gardens this autumn: while *Pyrameis atlanta*, for the second year in succession, has been entirely wanting from our own garden, where it swarmed in 1917, and in thirty to forty years' observation it has seldom failed to visit us in some numbers. *Urticæ* either had not emerged in the Chilterns in mid-August or was similarly scarce; while throughout September I saw but single specimens, and was more than a fortnight at Maidstone at the end of the month and beginning of October before a single example appeared one sunny morning on the 6th in the Brenchley Gardens. The blizzard which swept the southern counties on April 26th and 27th must have destroyed the gravid females wholesale. I noticed very few webs of larvæ either in Bucks., Middlesex, Herts., or Gloucestershire; and it is possible, of course, that, as last year, a spell of wet and rather cold weather at the end of August may have sent the emerging August imagines straight into winter quarters. But, whatever the cause, whether victim of climate (*urticæ* is circumpolar and a hardy insect) or parasite, the fact remains. The Small Tortoiseshell has been quite rare locally—

at all events, at the time of the normal emergence of the first generation. *Vanessa io*, on the other hand, has been common enough throughout its range—another curious instance of capricious appearance, as in Middlesex for many years from 1898 onwards it was the rarest of three mentioned, Vanessids, and some seasons, as now with *P. atlantica*, failed altogether.—H. ROWLAND-BROWN.

ARGYNNIDS IN WILTSHIRE.—This year the Argynnids were exceptionally common around Salisbury. *Dryas paphia* and *Argynnis aglaja* were quite common on the downs, while *A. cydippe* was abundant everywhere, and in some villages I saw specimens settling on the walls of the cottages. *Brenthis selene* was more in evidence than usual.—A STEVEN CORBET; Reading.

NOTES FROM GODALMING.—This year and last I took, at rest on tree-trunks, several specimens of *Lobophora viretata*; earliest date, May 10th. On June 14th of this year one specimen in perfect condition of *Mamestra albicolor* on flowers of rocket. On June 13th one *Eusina tenebrosa* also on rocket. These moths were all taken in my garden at Elstead for the first time. *Cherocampa elpenor* and *Melipotis porcellus* were also numerous, especially the former.—H. O. HOLFORD; Elstead Lodge, Godalming.

INO GLOBULARIAE.—The following notes are extracted from the entomological diary of the late Mr. A. C. Vine: May 7th, 1892: On the downs collected a few larvae feeding in the leaves of *Centaurea nigra*. July 6th: Bred 1 example of *Procris globulariae*, from larva found in leaves of *Centaurea nigra* growing near Bevingdean. July 9th: Bred 6 ditto; 11th, 1; 12th, 1; 13th, 5; 14th, 3. April 9th, 1896: Obtained about a dozen *P. globulariae* larvae at Moulsccombe Pit. The larvae were various in size at this date. April 15th: Obtained about 20 larvae of *P. globulariae* from Malling Hill, Lewes. April 30th: 22 larvae of *P. globulariae* at Moulsccombe Pit.—A. GIBBELL; 2, Wilbury Villas, Hove.

ANTIDIUM MANICVITUM, LINN., IN WORCESTERSHIRE.—The statement is often made in books that the Carder bee is practically restricted in its distribution to the southern parts of this island. I am therefore sending this little note simply to say that this last summer (1919) it was very frequent here in my Midland garden, visiting in numbers the massed flowers of *Anchusa italicica*.—J. W. WILLIAMS, M.R.C.S., etc.; Bewdley, Worcestershire.

CROCALLIS CLINGUARIA SIGNATIPENNIS.—In the 'Entomologist' for October Messrs. Newstead and Smith have bestowed the name *signatipennis* on a form of *Crocallis clinguaria*, and imply that the form is as new as the name. My series of this insect at present contains only ten specimens. Three of these are of the *signatipennis* form, and were captured as follows: S.W. Yorks, 1910 and 1912; Wicken, 1914. Two others approximate to this form, and bear labels "Hunts, 1906," and "Cannock Chase, 1918." It would seem that *signatipennis* is by no means new, and is both common and widely distributed.—H. DOUGLAS SMART; Shelley, Huddersfield.

NOTES FROM CHICHESTER.—It was not till St. George's Day (April 23rd)—a very beautiful spring-like day—that I noticed the

first *Pieris rapæ*, which with *Gonepteryx rhamni* was then flying in our garden. *Celastrina argiolus* was not seen till May 8th. Early in this month some *Chærocampa elpenor* were bred. On May 22nd an empty cocoon of *Plusia moneta* was found in the garden—the moth has been taken at light here. On July 21st an *Aglais urticae* flew into my bedroom and settled on the ceiling as if to hibernate, but it flew out of the window again two days after. The first of the second brood of *Celastrina argiolus* appeared on July 22nd. It was with some surprise that we saw a *Pararge egerides* flying over the flowers in the borders. Another—or it may have been the same insect—was observed in the garden on September 1st. This is the first instance, so far as I know, of this butterfly of woods and copses visiting the garden. The experience of other lepidopterists would be interesting.—JOSEPH ANDERSON ; Chichester.

SOME NOTES ON THE BUTTERFLIES OF THE SOUTH COAST OF THE ISLE OF WIGHT, 1919.—Having taken out a net on almost every sunny day throughout the season perhaps a few notes would be interesting. *P. brassicæ*, *P. rapæ*, *P. napi* : All fairly common, but not abundant. *E. cardamines* : Not plentiful. *C. edusa*, *C. hyale* : Not seen up to mid-October ; plentiful on the Downs in good years, especially *edusa*. *G. rhamni* : Never very common in the district ; I only saw five specimens. *D. paphia*, *A. aglaia* : Both common on the Downs, but the former is more plentiful in woods. *B. euphrosyne* : Uncommon. All my captures were made in borders of woods. *M. aurinia* : I should be glad to know if this insect still occurs along our coast. I have searched many that appeared to be ideal marshy spots, but without success. *M. cinxia* : This most interesting of our local butterflies was extraordinarily abundant in the larval stage. When about full grown an exceedingly cold south-west wind seemed to kill off a great number, or there would probably have been a record emergence. The preference of the larvæ for the low stunted plants of the plantain saves thousands from perishing as numbers of cattle are constantly grazing in *cinxia*'s favourite haunts. I found both larvæ and imagines quite two miles inland—in fact on the borders of one inland wood I took ten *cinxia* to one *euphrosyne*. It is a pleasure to record that the species is undoubtedly as common on the undercliffs to-day as when first discovered by Edward Newman eighty years ago. *A. urticæ* : Fairly common. *E. polychloros* : Scarce in our wood. *V. io* : Very abundant. *P. atalanta* : Fairly common. No variations worth taking. *P. cardui* : Scarce this year. *L. sibylla* : So far as my experience goes it is now restricted to one wood. I took a good intermediate between type and *nigrina*, but spoilt by piece out of lower wing. This species seems specially liable to injury of this nature, undoubtedly caused by birds. *L. sibylla* is more pursued by birds than any other butterfly I know of, and only its peculiar flight saves it from being exterminated. I counted over twenty attempts at capture by birds in less than fifteen minutes. Should a bird catch *sibylla* by the lower wing the insect escapes with a piece out of this wing owing to the impetus of its flight. This is probably the reason so many examples of the species have the lower wings chipped. *M. galatea* : Very abundant. *P. egerides* : Only one example seen. *P.*

megaera: Very common. Netted dozens in hope of turning up *I. lathonia*, as *megaera* much resembles a medium-sized Fritillary when on the wing. *H. semicle*: Very abundant on the Downs. *E. jurtina*, *E. tithonus* and *A. hyperanthus*: The first two species abundant every where, the latter rather scarce. *C. pamphilus*: Abundant. *C. rubi*: One of our commonest butterflies. *Z. quercus*: Abundant in several of our woods. *C. phryas*: First and second broods common, but third brood scarce. I saw a perfect specimen flying on the outskirts of the town at the end of February. As this species hibernates in an early larval stage I cannot account for the occurrence of the imago at so early a date; its markings appeared quite normal. *P. argus*, *A. medon* and *P. icarus*: All comparatively scarce this season, but the last-mentioned species usually swarms. *A. betiarius*: Both broods very abundant, but severely typical, for although I examined upwards of 2000 I did not find more than half a dozen aberrations—all very minor ones. *A. corydon*: Fairly common in certain parts, but not showing much variation. *C. minimus*: Common, but exceedingly local. *C. argiolus*: By no means abundant. *H. malvae*, *N. tages*, *A. flava*, *A. sylvanus*: All fairly common, calling for no special comment.—ERNEST CORNELL; "Burmah," Newport Road, Ventnor.

DORSIT ORTHOPTERA.—Mr. A. W. Pickard-Cambridge writes to say that he has a fine specimen of *Tettigonia verrucivora*, Linn., taken by his father on Bloxworth Heath about thirty years ago, and that *Gryllotalpa gryllotalpa*, Linn., used to be abundant (and perhaps is so still) in the swampy ground close to the bridge on the road between Bloxworth and West Morden.—W. J. LUCAS; Kingston-on-Thames.

RECENT LITERATURE.

Proceedings of the South London Entomological and Natural History Society, 1918-1919.

Notwithstanding the difficulties of the times, this Society has again produced an interesting volume of proceedings, illustrated by two plates and one text-figure—a striking variety of *Arctia caia*. The papers are less numerous than usual, the most interesting to the ordinary reader being perhaps "The Variation of *Epinephele tithonus*, Linn." (G. Wheeler, M.A.), illustrated by two excellent plates from photographs by F. W. Morice, M.A. The President (S. Edwards) took as the subject of the annual address, "Economic Entomology." The greater part of the volume of 124 pages is devoted to a full account of the proceedings at meetings and excursions, many interesting natural history observations being put on record. On p. 80, however, Mr. West is credited with giving the New Forest as a locality for *Metrioptera roeselii*, Hagenb.—a statement he will scarcely endorse! It is rather a pity that the index requires so many emendations.

OBITUARY.

We regret to hear that Mr. Robert Lawson, of 4, Moncrieffe Terrace, Craigie, died on September 24th last.

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EDITORIAL.

We have to announce, with very much pleasure, that Messrs. W. G. Sheldon and N. D. Riley have kindly consented to act on the Reference Committee of this Journal.

A NEW FORM OF *PLUSIA PULCHRINA*, HAW.

By C. GRANVILLE CLUTTERBUCK, F.E.S.

THE accompanying figure shows a form of *pulchrina* taken by me on our hills near Gloucester on June 21st, 1919, together with a type taken here on May 26th, 1893, for comparison. The variation may be described as slightly larger than the type, the purple-brown ground-colour being more brilliant and the usual golden Y-mark being replaced by a large wedge-shaped golden blotch. The space between the hind margin and the subterminal line on the fore wings is filled in with a beautiful pink shade. The specimen, a male, was taken at rest on a leaf of a small ash-tree growing by the side of the wood-path, and is in perfect condition, with the exception of the apex of the right fore wing, which is chipped slightly. It was shown to Mr. H. Rowland-Brown, F.E.S., a few days after capture, and pronounced by him to be a new form, if not a new species. I had the pleasure of showing him the bush from which it was taken. I have also shown it to Mr. A. B. Farn, who is kind enough to say it is "the catch of the season." It is a species very little liable to variation, and in Mr. Farn's long series there is only one variety, and in that the golden Y is replaced by a small golden dot. Mr. E. W. Lipton has kindly shown me his copy of Seitz' 'Macro-lepidoptera of the World,' and there is nothing like this variety figured in that work. Barrett says, in vol. vi, p. 117: "Variation is usually very slight, and confined to the degree of completeness of the Y and the extent of chocolate shading. Some specimens, however, taken in Gloucestershire by the Rev. Alexander Nash, are pale pinkish-purple, with violet reflections and a very pretty curved stripe of paler colour close to the base. In Sligo, Westmeath, and elsewhere in Ireland it is found in a rich, dark, strongly rippled

form, and at Omagh with a large orange spot in the middle of the fore wings. Very dark forms are found in the North of Scotland."

I have also shown the specimen to Sir George F. Hampson at the British Museum (Natural History Department), and he has kindly confirmed the identity of the species. Lord Rothschild



had brought up from Tring a fine dark aberration of *Plusia gamma* for comparison.

23, Heathville Road,
Gloucester.

NOTE ON COPULATION AND OVIPOSITION IN THE DRAGONFLY *SYMPETRUM STRIOLATUM* (CHARPENTIER).*

BY W. D. LANG, ScD., F.Z.S.

Sympetrum striolatum was observed at noon on October 4th, 1919, flying in numbers over a small pond. This pond, some ten by fifteen yards in extent, is situated in a pasture immediately behind the pebble ridge above the fore-shore between Worthing and Goring. It was very shallow, with down-trodden banks

* Besides descriptions and figures in the works quoted below, there is a very complete account of the copulation of dragon-flies by Erich Smidt (1915, 'Vorgänge in der Morphologie des 2 und 3. Abdominal-segments bei männlichen Libellen'; Dr. J. W. Spengel's 'Zoologischen Jahrbuch, band xxxix, heft i, pp. 87-200, pl. ix-xii'). I am indebted to Mr. H. Campion for this reference as well as for the references quoted below to papers by Calvert, Williamson and Walker.

occupied by a thick growth of *Carex* sp. from one to two feet high. There was little or no vegetation other than algal in the water of the pond, and hardly any animal life of much more than microscopic size, since the only animals noticed were a species of *Gyrinus* and the mollusc *Acroloxus lacustris* (Müller). The weather was very fine, but rather misty, with little or no wind, and hot for the time of year.

The *Sympetrum* were united in pairs in the *tandem* position, and the females of each pair were ovipositing, flicking the surface from time to time with the abdomen. In one case there were three individuals coupled *tandem*, two males in front, and a female behind. I was able to secure them all, but they disjoined themselves as soon as they were in the net, so that I could not determine which male was the foremost. Mr. H. Campion has kindly examined these specimens for me, and besides identifying the species, he pointed out that one male (which was decidedly the smaller) had probably emerged more recently than the other, as was shown by the more hyaline wings and duller stigmata, compared with the more deeply-stained wings and bright red stigmata of the larger male. Mr. Campion is inclined to think that the latter was the functional male, and that it was the smaller and less mature insect that, clasping the functional male *per collum*, caused the unusual phenomenon of three dragon-flies flying *tandem*. The smaller male also had an abnormal wing; the tip of one hind-wing had been regenerated after an injury early in its development. Besides the coupled pairs, one or two unattached males were generally to be seen hovering over the pond or flying wildly in its neighbourhood.

I was fortunate to see the meeting of an unattached male with a female. Their approach was unnoticed, but they met with some commotion of wings over the middle of the pond and immediately united, the male seizing the female by the back of the head with his anal appendages, and the female curving her abdomen under that of the male and coupling her ovipositor with the copulatory apparatus of his second abdominal segment. In this position they drifted rather than flew down to the ground among some stones on the bank. On walking over to find them on the stony ground I disturbed them, and they flew in a drifting manner into the grass some twenty yards from the pond. There I was able to approach them closely, finally lying down and examining them with a pocket lens; therefore they were not at all readily alarmed. The male grasped the herbage with his legs, while all but the terminal segments of his abdomen were straight and in a line with the thorax, and not curved, as in Calvert's figure of *Aeshna constricta*, Say (P. P. Calvert, 1906, 'Entomological News,' vol. xvii, pl. vii), and Walker's figure of the same species (E. M. Walker, 1912, 'The North American Dragonflies of the Genus *Aeshna*', University of Toronto Studies, Biological

series, No. 11, pl. ii, fig. 1). The last few abdominal segments were closely appressed to the head of the female over the suture between the eyes (the median eye-line of R. J. Tillyard, 1917, 'The Biology of Dragon-flies,' fig. 1, a, on p. 10, *me.*), and curling tightly round to the back of the head, concealed the anal appendages, which were deeply plunged into the cleft between the head and the thorax, so that the details of clasping could not be observed. But it seems impossible to suppose that the inferior appendage bent forward so as to rest upon the top of the head, as described by Williamson for four Anisopterous genera, including *Sympetrum* (E. B. Williamson, 1906, 'Entomological News,' vol. xvii, p. 143), figured by Calvert and by Walker in *Æschna constricta*, Say (P. P. Calvert, *loc. cit.*, and E. M. Walker, *loc. cit.*, and pl. ii, figs. 2-4), and claimed by Tillyard (*op. cit.*, p. 33) for Anisoptera generally; for the whole of the last segment appeared to be in the post-cephalic valley, while the ninth segment lay over and between the eyes, and closely appressed to them. I had not, however, in my mind, when the observation was made, the exact position of the inferior appendage noted in the above descriptions; and would hesitate, since I was not looking out especially for this point, to claim the case of *Sympetrum striolatum* as an exception to the general rule expounded by the authors quoted. The female's thorax was bent on her head so as to oppose its lower surface to the ventral surface of the male's abdomen, which she clasped in the neighbourhood of the sixth, seventh and eighth segments with all three pairs of her legs. Her abdomen continued the thoracic bending, and as it approached the male abdomen, bent slightly away again, thus bringing the ovipositor opposite the copulatory apparatus on the male's second abdominal segment. The anal appendages of the female approximated to, but did not touch, the ventral surface of the male's thorax. When the couple were first observed in the grass there was a pulsating movement within the copulatory apparatus; but this soon slowed down, and after from five to ten minutes from their first meeting the insects showed a restlessness, the female next disconnected and straightened her abdomen, and the pair, in the *tandem* position, first rose into the air for about ten feet and then made directly for the pond. I failed to follow so as not to lose them among the several ovipositing couples, but closely observed one of these as the female constantly flicked, or quickly stroked the water with the tip of her abdomen, irregularly, but on the average of about once a second, and approximately in the same place. The upstroke and the first part of the downstroke were quick, but the downstroke after the abdomen touched the water slightly slower, so that the female did not appear to be merely dropping her eggs, but rather wiping them off her abdomen on to the surface of the water, or just below it. Doubtless the function of the male was to balance her during this

action, so as to keep her horizontal when this wiping pressure was applied. After a few minutes of ovipositing the couple separated, and I was unable to follow the after-adventures of the female. On examining an alga-covered* stone lying just beneath the surface where the female had been ovipositing, I found on it a few elongated eggs, corresponding in size and shape with those extruding in a gelatinous mass from the oviduct of the female above mentioned as caught in connection with two males. Presumably, therefore, these were the eggs of the female whose oviposition I had been observing.

1919 IN THE NEW FOREST.

BY HUGH P. JONES.

ALTHOUGH allowance must be made for the undoubtedly bad season, my this year's collecting in the Forest compares badly with that of 1918 in Northants, Hunts, and Cambridge, and I have scarcely a rarity to record. Nevertheless, the following observations and captures made, as they were well off a well-beaten track around Brockenhurst and Lyndhurst, may be of some interest. I was somewhat astonished to find that many wood-haunting species of the east-midland counties are here absent from the Forest, or *vice versa*. For instance, *Melanargia galatea*, locally abundant in most woods from Huntingdon to Stamford, here shuns the woods altogether, but becomes common again on the downs in Dorset, etc. Again, *Zygæna filipendulae* swarms on the thistles in Monks' Wood, Hunts, but in other localities is a chalk insect. These examples could be greatly multiplied, and it must be remembered that a former famous locality for *Lycæna arion* in Northants., Barnwell Wold, is a wood.

This question of distribution is best worked out by means of the butterflies and moths, but equally applies to other insects. The counties of Northants. and Hunts. seem to accommodate a large portion of the south-western insect fauna in their woods—the only land, by-the-bye, that is uncultivated.

I did not arrive down here (Lymington) until towards the end of May, therefore missing many of the spring insects, and an inability to obtain the requisite apparatus, combined with a not unnatural mania for exploration, undoubtedly militated at first against success in collecting, so I will date my notes from the beginning of June, when work began in earnest.

After considerable prospecting in the neighbourhood of Brockenhurst and Lyndhurst, I finally abandoned the better-known localities in favour of the woods near Lymington, settling down for a time in a large patch of chiefly second-growth birch

* Probably *Monostroma* or *Enteromorpha*.

forest, belted with oaks and an occasional beech. The beech trees in this part—which appears to be little worked by collections—are seldom allowed to grow to any size, being cut down periodically for use in toy-making at Brockenhurst, so the wood is rather open, with a tangled undergrowth of brambles, *prunus*, privet, etc., with here and there a patch of heath and gorse. The familiar forest streams are greatly in evidence, and make the ground very boggy in parts, forming small mosses, whilst a large area of elevated ground to the north having been thickly planted with pines and other conifers, we get an immense variety of plant life, which is not without its effect upon the insect population. Seldom have I seen the gorgeous dragonfly *Calopteryx virgo* in such abundance as here, hanging to, and fluttering about the thick growth of alders, sallows, and other bushes, bordering the streams—which, small as they are, come down with such force in the winter that in many places they have worn out gullies, measuring from 6 to 8 ft. in depth. Like all dragonflies *C. virgo* is more easily seen than captured, the first few strokes of the kite-net causing them to vanish with almost astonishing rapidity, considering their slow and lethargic flight. Butterflies were abundant in the open parts of the wood at the beginning of June, and I found the following all flying together: *Brenthis euphrosyne* and *Brenthis selene* (the latter just emerging), *Pararge egiraides*, *Nemeobius lurina*, *Callophrys rubi* (also common at Milford-on-Sea in May), *Celastrina argiolus*, *Hesperia malvae*, *Nisoniadis tages* and the usual *Gonepteryx rhamni*, *Pieris napi* and *Euchloe cardamines*. Larvae beating produced a few full-fed *Zephyrus querens*, *Catocala promissa*, and a number of commoner oak-feeders, including *Hadena proteus* and many Geometræ. The pretty carnivorous beetle *Calosoma inquisitor* also fell now and again into the tray, but Coleoptera taken in this way were scarce, even from whitethorn blossom.

The great feature of the wood in June was the Odonata, and it would be difficult to say which of the following was the commonest: *Libellula depressa*, *Cordulegaster annulatus*, *Pyrrhosoma nymphula*, or *Calopteryx virgo*. *Orthetrum cæruleooculatum*, although scarce in the Forest, was very abundant on the marshes bordering the Lymington river south of Boldre, and I found a few *Agrion puella* sharing the haunts of *C. virgo*. A splendid ♀ *Anax imperator* haunted an open part of the wood for some days (I trying to capture it all the time!), but this beautiful species disappeared from the Forest after a spell of bad weather in July, although its almost equally handsome relative, *Cordulegaster annulatus*, continued in being up to September.

I several times watched the latter ovipositing, which it does with scarcely a second's interval between each thrust of the abdomen, always choosing the pools in deep shade.

Towards the end of June the flies, hitherto only an annoy-

ance, became a veritable plague, and never before have I been so bitten! I give a brief list of "blood-suckers," chiefly interesting because they were all taken in the act of biting my person one afternoon in July: *Culex cantans*. *Hæmatopota plurialis* ("Cleg"), *Therioplectes tropicus*, *Th. distinguendo*, Verr., *Atylotus fulvus* (not uncommon locally, a beautiful thing in life), *Tabanus bovinus* (on my stocking), *T. autumnalis*, *T. bromius*, *T. maculicornis* (the smallest Br. "Gad."), *Chrysops cæcutiens* (in scores), and one *C. quadrata*.

For several days in July I was forced to give up collecting owing to the sight of both eyes almost disappearing, chiefly the work of *Chrysops cæcutiens*, who delighted to bite on the forehead, just over the eye.

Another handsome although somewhat repulsive plague was *Th. distinguendo*, Verr., but being larger and *noisy* was easier to avoid. *T. bovinus* settled to bite (as noted above) but did not actually penetrate.

(For identification of several of above I am indebted to Miss E. K. Pearce, of Bournemouth, and Mr. N. O. F. Pearce, of Cambridge, without whose kind aid a number of my "blood-suckers" would yet remain unnamed.)

The great *Tabanus bovinus** was continually "booming" around throughout July and August, but seldom settled until late in the afternoon, when it sometimes frequented decayed and fallen tree-trunks, as I discovered whilst searching for the quaint-looking dipteron *Allophora hemiptera*. During August, whilst armed with a tube of '880 ammonia ready for immediate application, I rather encouraged *T. bovinus* to bite my hand as an experiment (probably for both of us!), but without success. Such shyness has its good points. Whilst battling with the flies I managed to find time to search the three large "fritillaries" and *Limenitis sibylla* for aberrations, with a fair amount of luck. Sad to say, although early in the season, the better forms were considerably worn, especially those approaching ab. *nigrina* of the latter species, of which I found three females so hopelessly worn that I could do nothing with them except try and obtain ova. They died without laying, however, and but for a fine and perfect intermediate and two ♂ *D. paphia* with confluent spots, I should have had a very poor share of this year's varieties, although minor forms of *B. selene* and *A. cydippe* were not infrequent. A fine ♀ *paphia* with confluent spots was also seen—and missed!

Var. *valezina* † was rather scarce near Lymington, although very fine and large, but on higher land towards Cadnam it in one

* Abundant near Lymington. I caught 20 ♀ ♀ one afternoon in July, when flying round me, and probably missed half as many again.

† Almost all typical ♀ *paphia* from the New Forest are more green than brown, approaching *valezina*. In the Midland woods, where the butterfly swarms, the reverse is the case, and they seem a different race altogether—especially noticeable on the under-side.

locality actually outnumbered the type. They were poor and undersized specimens, however, when compared with the Lymingtonians, which are bred in a moist situation. *Limenitis sibylla* was uncommon in many woods (*e.g.* Queen's Bower), but I found it in extraordinary numbers in a damp and rather gloomy part of the forest a stone's throw from the Lymington river, where females, basking in the sun on the bracken fronds, attracted as many as a dozen males at a time, and as *D. paphia* and the exquisite var. *anceps* of *Calopteryx virgo* were in numbers all round, the combination of colours was extremely beautiful.

Up to the middle of July *Apatura iris* failed to put in an appearance, but on the 17th I captured a fine ♂ under very tame circumstances. I was after Odonata at the time, when my brother (a non-entomologist), who was with me, suddenly said, "That's the first White Admiral we've seen here," and pointed to a butterfly just about to settle on a sallow bush overhanging the stream. I looked in the direction pointed out, and seeing at once what it was, made a swoop with the net and captured with ridiculous ease the first "Emperor" I had seen since 1911 (in Monk's Wood, Hunts.). No doubt *iris* when flying low is sometimes passed over in the New Forest in mistake for large ♀ *L. sibylla*, as collectors in search of the greater prize give most of their attention to the tree-tops. No further specimen of *iris* gladdened my eye, and it is undoubtedly scarce in the Forest, although, as I have hinted, it may sometimes be overlooked.

I was too late for larvæ-beating in the spring, and don't know if any were taken. Whilst on larvæ it may not be out of place to mention the paucity of "Hairstreaks" (both larvæ and imagines) in the Forest. Quite a small wood in Hunts. and Northants. will produce the caterpillars of four species in the course of a few hours' beating (and one can net *C. rubi* and *C. palæmon* in the intervals!). Here the only species that can be beaten regularly is *Z. quercus*, and even the imago is not very common. What a difference when compared with such a classic collecting-ground as Monk's Wood, when, having beaten your full complement of *pruni* larva in early spring, the butterfly later becomes quite a nuisance locally, following you about and getting in your way and distracting you from more serious business! For *pruni* is only a thing of beauty when bred; directly it leaves the pupa-case its only object in life—beyond love-making—seems to be to reduce its wings to rags in the quickest time possible, its baffling flight in and out of the sloe bushes seeming especially adapted for the purpose of scale denudation.

Nevertheless I should have been only too pleased to see this attractive little species flying about the *Prunus* in the Forest, and all being well next year shall turn out a few pairs in my favourite wood (private) and see how they get on. Should any stray collector there see them flying, I hope he will have read this!

"Mothing" in July and August was very unproductive; scarcely anything seemed flying. I kicked up the beautiful little *Hyria muricata* pretty commonly in places, and *Diacrisia sanio* was abundant enough, but these were exceptions, "sugar-ing" from July 1st to end of August producing literally nothing, after which time *A. pyramidea* became common, and a few *Catocala sponsa* and *C. promissa* put in a belated appearance, worn to shreds, and accompanied by a solitary *T. fimbria* (which I have never seen at sugar until September was well on).

Eugonia polychloros to the number of six were seen on August 1st, but apparently then went into hibernation or something as I saw them no more. The handsome dragonfly *Æschna cyanea* also became abundant from that date, and the extraordinary uninteresting immature form of *Sympetrum striolatum*. Red males were scarce even late in September. *Eshna grandis*, so common in the Midlands, I did not see here.

Several supposed fast-flying Diptera when caught turned out to be the beetle *Necrophorus mortuorum*. I have not noticed this species flying in bright sunshine before, but suppose it's the habit of the beast.

Hornets were very numerous in the autumn (δ and γ), and flew by night as well as day, as many as half a dozen at a time on the sugar patch, where they were a great nuisance. The following is a list of autumn Noctuae taken at treacle from September 6th to October. Although the number of species is gratifying, the scarcity of quite common things will be noted. In ordinary years I should think my "pitch" would be ideal: *Asphalia diluta*, *Agrotis puta* (1), *A. ypsilon*, *A. saucia* (a very worn few), *Hadena protea* (the only really common thing, and very varied), *Amphipyra pyramidea* (getting over), *Calynnbia trapezina* (2), *Cirrhædia xerampelina* (one perfect and several worn; this pretty species would probably have been taken on ash trunks in August commonly had I gone for it), *Anchocelis lunosa* (2), *Amathes lota*, *A. macilenta*, *A. circellaris* (2!), *A. helvola* (1), *A. pistacina* (scarce), *A. litura* (scarce), *Ochria aurago* (only one, worse luck!), *Xanthia lutea* (*flavago*), *X. fulrago*, *Lithophane socia*, *Graptolitha ornithopus* (*rhizolitha*), and *Catocala sponsa* and *C. promissa* (much beyond their time, and from which I obtained a few eggs). I forgot to mention *Orrhodia vaccinii*, *Scopelosoma satellitia* and *Scoliopteryx libatrix*, all of which were scarce. Moths are still coming to date of writing (October 10th), and I may add to above list.

Taken all round the season has been very disappointing for insects generally, although I have taken a good number of everything, the above notes being little more than a brief summary of the more popular orders.

Lymington district appears to be the least worked portion of the New Forest, and is exceedingly rich in insect life. Even in

the town *Lucanus cervus* alone gives work for the collector, and in June was a regular visitor to sugared trees in the garden!

Eastlands,

Lyminster, Hants.

A NOTE ON DUTCH *CHYSOPHANUS DISPAR*, HAW.

BY N. D. RILEY, F.E.S.

I HAVE recently had an opportunity of examining 3♂ and 4♀ specimens of the so-called Dutch *Chrysophanus dispar*, Haw., at one time thought to be identical with our extinct English race, and have found them most interesting. Although they cannot be called true *dispar*, they make the nearest approach to *dispar* I have seen in any Continental race.

In size and general coloration there is, to my mind, nothing to distinguish them from *dispar*. There are, however, the following small constant differences:

(1) In both sexes the marginal red band on hind wing underside is consistently narrower than in *dispar*; it is also consistently broader than in other continental races I have examined.

(2) The black spots on the underside, especially of hind wing, are consistently smaller than in *dispar*, and on the whole larger than is the rule on the Continent.

(3) In the ♂ the black marks in all and at cell-end on the upper side of fore wing are consistently smaller than in *dispar*; also on the whole larger than is the average of Continental specimens.

(4) The hind margins of fore wings below in both sexes are invariably greyer than in *dispar*, in which they are usually brownish.

(5) The tendency in the ♀ for the black spots in the band on the upperside of the fore wing to be produced towards the base of the wing in long rays is apparently very pronounced in Dutch specimens—much more so than in *dispar* or in any Continental race I know of.

(6) The ground-colour of fore wings below in both sexes is slightly paler than in *dispar*, but not so pale as in ordinary Continental forms.

From the above it will be seen that the Dutch race is clearly intermediate between *dispar* and *rutilus*, and to my mind is equally distinct from both these forms. It is only natural to expect to find in the Dutch specimens the race most nearly allied to our extinct race and most pleasing to find that this is actually the case.

LEPIDOPTERA AT RANNOCH IN 1919.

By F. G. WHITTLE.

THE desire to see *Brachionycha nubeculosa* at home among the birches at Finnart led me to journey into Perthshire in weather which was far from inviting. The huge drifts of snow, as seen from the railway between Glasgow and Rannoch, soon made me realise that between me and the much-wanted "Sprawler" there were difficulties which would somehow have to be mastered. I was therefore much cheered when, arrived at Rannoch, I found that my troubles were not likely to be half so serious as I had thought, that delightful district having escaped with a quite moderate snowfall. On the day of my arrival at Camghouran (March 21st) I got among the Finnart birches and was duly rewarded in getting my first *nubeculosa* ♂. A week of bad weather followed, and I did not again see the species until April 2nd, between which date and the 9th I was able to get as many as I required, the maximum number on any one afternoon being seven. I had at first a difficulty in getting the moths to pair, but the difficulty disappeared when the moths were exposed to the weather. I sleeved the young larvæ, apparently a very healthy lot, under the most favourable conditions, but many of them failed to pupate, the number of those that got through being about fifty. Carie is probably quite equal to Finnart as a locality for this local species. By sweeping or searching the *Vaccinium* in or near the Black Wood I obtained larvæ of *Asthenia ustomaculana* (commonly), *Lithocolletis raciniella*, *Coleophora vitisella*, *Orthotenia mygindana* and *Lygris populata*. *Lophodorus ministrana* larvæ occurred on birch. A trip through the Pass of Killiecrankie to Blair Atholl produced an abundance of *Lycia hirtaria* (large form as figured in South's 'Moths of the British Isles,' ser. ii, pl. 1) on the elms and fences skirting the road, and one *Xenolechia humeralis*. The cocoons of *Cimbex sylvarum*, well known to all lepidopterists who have searched the Rannoch birches, were common at Finnart, as also were the variable imagines which commenced to emerge the first week in May. About the third week in May I obtained a number of *Eriopsela fractifasciana*, both sexes—a fine large form (wing expanse 20 mm.), compared with which our southern insect is a poor thing. Mr. Pierce has been good enough to examine the genitalia for me. I took three males of this species last year, which, misled by their large size and different appearance, I recorded ('Entomologist,' vol. lii, p. 54) as *ericetana* in error. *Callophrys rubi* was abundant among the *Vaccinium* near the Black Wood, and *Nemophora pilella* was occasionally put up in the late afternoon. As one would expect, in the extensive birch-woods at Rannoch *Phloeodes tetraquetraea* is strongly represented and shows much variation. Two of these variable forms, one

greyish-white with much irroration, and the other—which for a time was a great puzzler—a dark red-brown, are noteworthy. When collecting near the Camghouran burn, on the afternoon of June 3rd, I netted a *Tortrix* unlike any known to me. It seemed to rise with a rather weak flight from some mixed growth, including *Erica* and *Vaccinium*, and has now been identified by Mr. J. Hartley Durrant as *Anaglypta tineana*, Hb., new to the British list.

The following is an attempt to describe this insect based on this one specimen: Wing expanse 15 mm., costa well arched, fore wings brownish-olivaceous, costal strigulae dark fuscous and silvery-whitish, a large grey tornal blotch with a mass of silvery scales at the anterior edge, cilia glossy, pale olivaceous; hind wings pale grey, glossy. Head with palpi and thorax brownish-olivaceous; anal tuft pale.

According to Hofmann the species occurs in Germany, Austria, Holland, Galicia, West Russia, Sweden, France and Piedmont



Magnified twice natural size.

and the larva is described as dirty brownish-grey, with darker tubercles; head yellow-brown, plate paler; lives June to September on *Populus tremula*, *Crataegus*, *Prunus domestica* and *spinosa*, *Pyrus malus*.

I am much indebted to Mr. W. G. Sheldon as well as to Mr. J. H. Durrant—to the latter for the identification, and to the former for allowing me to make extracts from the works of various Continental authorities who have dealt with this species.

Retinia posticana was netted June 4th. I feel sure that someone with more energy than I possess will some day get this insect in plenty at Camghouran: on the 6th *Abrostola tripartita* and a larva of *Diplodoma herminata*. It is rather singular that when I was, last year, collecting at Camghouran, I should have written the Rev. C. R. N. Burrows that it was quite useless to hunt for his special wants. This year, quite unsought, a *Solenobia*? sp., *Acanthopsyche atra* and *Diplodoma herminiata* thrust themselves in my way. Larvae of *Polia chi* and *Eupithecia sovimata* occurred; *Argyresthia præcocella* was knocked out of juniper; *Lithoclellis spinolella* was not uncommon at the loch-side; *Argyresthia sorbiella* was found at Carie; *Acompsia sub-aquilea* occurred under bracken at Camghouran. On July 1st a larva of *Entephria cæsiata* was found, stretched out on a boulder

at the top of Grayvel, and on the 9th *Sesia scoliiformis* ♂ was found at Camghouran; on the 24th *Lithographia cinerana* emerged and was found sparingly on the few aspens growing near the Camghouran burn; a week later this species was abundant on the aspens near the Carie burn; on the 25th a larva of *Calocampa retusa* was found in a bog; *Steganoptycha augustana* was flying among the small sallows at Camghouran; *Bombycia riminalis* emerged on the 29th. *Peronea maccana* commenced to emerge August 18th, and occurred more or less freely in the Black Wood up to the middle of September. I tried various ways of working for this insect until, favoured by an accident, I got it in plenty. Brushing the *Vaccinium vitis-ideæ* with a net and the use of a switch seemed to be of little use, but a visit to some rising ground carpeted with *Vaccinium* and having a very limited growth of bracken—at a spot where the pines were not too many to obstruct light and air—produced the insect in plenty. September 17th was dull, particularly in the afternoon. I did not consider it favourable for *Maccana*, but resting, fully exposed, on my few square yards of bracken, I had no difficulty in securing thirty-two specimens, a good proportion of them being of the fine ashy-grey and silvery-grey forms. Other spots in and near the Black Wood which appeared to be almost as favourable failed to appeal to *Maccana* as did this one particular spot. *Depressaria ciliella* came to sugar September 11th: *Peronca rufana* emerged as late as November 2nd.

7, Marine Avenue,
Southend-on-Sea.

DAPHNIS NERII AND OTHER SPHINGIDÆ IN THE ALPES-MARITIMES, 1919.

By CHARLES E. MORRIS.

I WAS not surprised to read in the 'Entomologist' for October (vol. lii, p. 237) of the capture of *Daphnis nerii* in the south of England, for there has been the most extraordinary visitation of this magnificent Sphingid here this summer. We got back from St. Etienne-de-Tinne to Le Cannet about September 10th. As soon as we entered our garden we noticed frass from the "laurier-rose" feeders on the ground, but could not see any larvae just then. After lunch my friend, Mr. Tucker, went over to the Public Square Garden in front of our villa, and almost immediately came back with a fine full-fed larva. Then we began to hunt diligently in our garden and three were found. Next day in the Square and other gardens, seven, and so on until we had obtained thirty-three. Eggs also were discovered, and one of these I brought right through, although I consider it a delicate larva—*very* in the young state. But what is more remarkable and more satisfactory, when I got downstairs after an indis-

position there were two noble moths, a male and female, just emerged drying their wings in spite of the cold spell which had set in—magnificent in colour, such a splendid green and rose with well-marked neuration and canary-yellow bands (inter-segmental on the abdomen). I find at the time of writing that several more are about to emerge, and this makes the second, or rather the third emergence, as I find upon inquiry from a resident collector that he first noticed the larvæ in the beginning of July. These he got out in August. At the end of that month and the beginning of September he had another brood of full-fed larvæ, imagines from which have been coming out all last month and still are. After the first frost at the beginning of November I found several young larvæ frozen on the shrubs; they never revived; the same fate had befallen the larvæ of *Pseudophia tirhaca*, Cr., several of which we found frozen on the *Lentiscus*. This was due to a sudden coup of icy wind-frost after a very warm week, and the rapid change was preceded by a very heavy cold rain-storm and snow on the hills, with apparently disastrous results to insect life.

The larvæ of *D. nerii* are marvellous, immense as are all Sphingid larvæ, with those truncated anterior segments as in *E. elpenor*, etc., and of the most marvellous colours. I noted four forms, always with the same design except in the case of the clear green and white larvæ, which never had the dark, broad, wedge-shaped, coalescing patches up the sides. This belongs only to the olive-coloured and bright salmon-pink and nankeen-yellow forms. In the three latter forms the two immense eye-spots on the fourth segment are always shot with pale rose over the peacock-blue, giving an opal or iridescent lustre to them, whereas in the pale green and white form the eyes are an intense shaded antwerp blue shading to white in the centre, and so brilliantly luminous are these spots that it was difficult to believe that they have not the power of giving out light in the dark. But I found such was not the case, as I examined them frequently at night.

The pupa is also most beautiful, so transparent over the wing-cases with theurious median dark line straight down the centre between the wing-eases. I suppose it marks the median suture dividing the proboscidal sheath, and the large sepia-coloured spots on either side of the abdomen in the region of the spiracles make it very handsome.

Well, for fourteen years we have tried to get *D. nerii* at Cannes, so we are very delighted to find an abundance so suddenly. I know of about one hundred having been captured in the larval state this season. Our gardener brought me two pupæ alive that he raked out from under an oleander. Both showed a disposition to emerge, but the cold arrived when they were well coloured. One came out a hopeless cripple, the other died. These two I

brought indoors and had tried to force. Owing to fuel difficulties I could not keep the heat up all the time and they failed. The others were not coddled at all, but were just left as they spun up under leaves. I tore up quantities of dry plantain leaves, and I found that the larvæ went under them most freely, and some into dry peat fibre ; for they do not go down into the earth, only under the surface, and I am sure they hate moisture. The web is very light and meshy, like a bit of lady's net veiling, but strong.

Altogether this has been a wonderful year for Sphingidæ. We found during October twelve larvæ in all stages of the large form of *Hyles euphorbiae* (not *H. nicea*, Prun. ; I wish it were !). To these must be added three *Sphinx ligustri*, very uncommon here, on *Laurestinus* ; five *Eumorpha elpenor*, also very rare, on *Epilobium* ; and two *Smerinthus ocellata*.

Of the *Manduca atropos* larvæ taken, three are of the brown form from jasmine, two gorgeous yellow and blue striped from, strange to say, Japanese chrysanthemum, *C. sinensis*.* The two latter were remarkably fine specimens, and I still have one feeding found on the kind of *Solanum* which is commonly hawked about the Loudon streets as the "winter cherry," but it does not seem to digest it well. When found it had eaten some of the scarlet berries ; the frass was bright scarlet and it seemed out of sorts. No doubt it felt the cold, but since capture it never eats more than one small leaf twice a day.

Villa le Chatelet,
Le Cannet, Alpes-Maritimes ;
November 13th, 1919.

NOTES AND OBSERVATIONS.

THE SYDNEY WEBB COLLECTION.—The second portion of this well-known collection, consisting of the remainder of the Butterflies and part of the Geometers, was sold at Stevens' Auction Rooms on Tuesday, December 9th, and although no lot touched the record prices obtained in the sale of the first portion, many sold at very high figures. An almost unicolorous dark brown variety of *Melitaea athalia*, lot 3, set the pace at 12 guineas, and three *Eos* forms of the same species made from £5 10s. to £6 10s. each. *M. aurinia* (*artemis*), forms with broad buff bands, brought £4 and £5 10s., and one almost all black £7, and the best *M. cinxia* £5. *Rumicia phleas* forms appeared to be in request, a nearly unicolorous blackish one making £3, one with the forewings, except the margins, entirely coppery £7 10s., one with large confluent spots £12, one in which the usual black markings were replaced by golden brown £11, and a nearly unicolorous pale brown specimen £5, while *Schmidtii* forms offered in lots of two each realised £2 10s., £4 and £5 10s. per lot. An underside *Thecla w-album* with broad pale fascia brought £5. There were long series of Lycenids, and although several lots failed to find buyers

* Seems to be a favourite food-plant on the Riviera. Mr. H. Powell records it at Hyères (Tutt's ' Brit. Lepidoptera,' vol. iv, p. 433).—ED.

and had to be coupled with others to effect a sale, others, described by the auctioneer as "choice forms," soon ran up to tall figures. *Agriades corydon*, "a very black male," made £10, three gynandromorphs £7, £7 and £5 10s., a dark leaden-blue male £4, and one with large white submarginal blotches £6. *A. bellargus*, lilac-blue males, brought £3, £2 15s. and £2, a gynandromorph, "right side male, left streaked male and female," £12 10s., a rich blue female £8, an underside "white with broad black streaks in fore wings" £11, and another streaked form £4. Well-marked undersides of *Polyommatus icarus* made £3, £4 and £6 10s., "hermaphrodites" in lots of three from 26s. to £4 10s. per lot, and a lot of twenty-seven specimens including two lilac-blue forms £4. A lot of five *Plebeius ayon* in which two "hermaphrodites" were included brought £9 10s., and a lot of two *Augiades comma*, one a cream-coloured male and the other an underside with only two white dots, £8 10s. Among the Geometers a suffused dark *Veulia macularia* made £7 10s., one with yellow spots on disc £7, a lot of three "blotched vars." £3 5s., one of three "near quadri-maculata" £2 10s., and another of two £3. A melanie *Selenia lunaria (illustraria)* sold for £4 10s., a lot of four *Crocalis elinguaria* including unicolorous, black and smokey-black forms for 50s., a lot of five *Thaumnonoma wanaria (wanaria)* including a black form for £2 15s., a black *Cabera pusaria* 42s., and another similar 21s., a black *Xanthorhoe montanata* in a lot with two others 45s. the lot, a suffused streaked *Mesoleuca albicillata* £6, and one similar £3 5s. Two white specimens of *Aburus grossulariata* ran up to £16 5s. 6d. and £18 7s. 6d. respectively, a white with faint yellow markings £7, and a white with black spots £10 10s., but the more ordinary forms in a long series failed to rise above a few shillings. Of the species coming under the category of rarities as distinct from varieties male *Chrysophanus dispar* made from £2 to £8 apiece and females from £2 5s. to £10, and *Nematus semiarctus (taeis)* from 45s. for a lot of seven to £4 for two fine specimens with full data. *Cleora angularia (vidinaria)* in lots of two went for 30s. to 65s. per lot, *Parascotia fuliginaria* from 5s. to 20s. each, *Acidalia perochraria* 28s. and 37s. 6d. per couple, *A. herbaria* 8s. to 20s. apiece, and *A. circellata* 6s. to £1 the half-dozen. The total produced by the day's sale was just over £700, to which the portion of the butterflies included in it contributed nearly £500. A further portion of the collection will be offered on Tuesday, February 10th, 1920.—R. A.

ANTHOCLEA EXULANS NOT IN SHETLANDS.—In Mr. Rowland-Brown's interesting article on *A. achillea* in the October number reference is made to the North Shetlands as a locality for *A. exulans*. Through Mr. Sheldon some further information regarding the specimens supposed to have been taken in this locality has been obtained which indicates quite definitely that they have been incorrectly labelled. The specimens in question were obtained by me at a sale at Stevens', and amongst a few labelled Braemar or Aberdeenshire and various years were three specimens labelled in the same handwriting, "N. Shetlands, 1908. A. E. Cannon." Mr. Sheldon has, however, discussed this matter with Mr. A. Horne, of Aboyne, who states that all the captures of *A. E. Cannon* at Unst

(which was the only island he visited) passed through his hands and there were no *exulans* amongst them. The only inference that can be drawn is that the specimens were incorrectly labelled by someone before I obtained them, and this would appear to finally dispose of the likelihood of N. Shetlands as a locality for *exulans*.—B. S. CURWEN; 9, Lebanon Park, Twickenham.

HIBERNATION OF AGLAIS URTICEÆ.—Notes on this subject have already appeared in the last volume of the ‘Entomologist,’ from Mr. Rowland-Brown (pp. 68 and 137) and from the Rev. H. D. Ford and myself (pp. 89 and 90), dealing with the early hibernation of the species in 1918. I am tempted to raise the topic again, for the past year seems to have provided a similar phenomenon—at least, so far as I was able personally to ascertain. Foraging over a tract of country extending from Berkhamsted Common to Watford in the one direction, and from Chesham to St. Albans in the other, on September 27th, 28th and 29th, I did not see a single example of *urticeæ*—a circumstance of considerable singularity, for all three days provided genial weather, and the species has always been common in Hertfordshire, and upon the Bucks. border extremely so. For years past I have seen the insect on the wing to well into October, and it is difficult to suggest an adequate reason for its early disappearance in 1918 and 1919. Is *urticeæ* developing the tendency, so pronounced in *G. rhamni*, of seeking winter quarters immediately on its attaining the imago state, or are we to assume the clerk of the weather is the guiding spirit of its actions? *Urticeæ* made a rather tardy emergence this summer in Hertfordshire, which is sufficiently remarkable considering the glorious weather of the first half of August, and further, its numerical strength did not seem to be up to the average. Isolated and perfectly fresh examples were met with in the latter half of August, but the cold snap which set in may have had something to do with the September absence. If, however, we admit the validity of the weather theory, how does it come about that it has taken until the present time to be made manifest? It would be absurd to suggest that *urticeæ* has become constitutionally delicate while other butterflies are braving the perils of “Indian summer”—*Pieris rapæ* was out in profusion on September 27th, and at least two *Pyrameis atalanta* were seen on Michaelmas Day. Several *Pieris rapæ* and one *Rumicia phœas* were noticed on Sunday, October 19th, but again *A. urticeæ* was an absentee.—ERNEST W. NIMMY, F.E.S.; 210, Whippendell Road, Watford, Herts.

AGLAIS URTICEÆ.—With reference to Mr. Rowland-Brown’s remarks on this species my experience was somewhat different to his. Hibernated specimens were plentiful in early spring, as he has observed, but though we enjoyed the April blizzard to its full extent I noted *urticeæ* still in numbers after it, and have never seen a better crop of the larvæ than this summer produced. But, like Mr. Brown, I have seen no imagines wild this autumn, and thought it a little strange, as I bred a good many, every one emerging and none being ichneumoned, so the larvæ were all right. *P. atalanta* also was very scarce here. Has anyone noticed a scarcity of winter moths? In most years (except, of course, during the war) my window is visited by shoals of *Brumata* and plenty of *Aurantiaria*, *Defoliaria*, *Pennaria*, and *P. populi*. This year I have seen perhaps half a dozen *Brumata*,

a single *Pennaria*, and four *Aurantiaria*, and that is all. There has not even been a *D. contaminana*—usually abundant.—W. CLAXTON; Navestock, Romford, December, 1919.

MELITaea ATHALIA IN KENT AND SUSSEX.—Prior to 1914 I had repeatedly heard of the gradual disappearance of *M. athalia*. On my first hunt for this butterfly in woods near Whitstable I met a well-known professional who assured me that the species was undoubtedly gone for ever. Somewhat damped in spirit I renewed the hunt, but no luck that day nor on the next three, but on the fifth I found it in plenty. From Canterbury to Heathfield next, and on June 16th, 1918, I started for a hard day's work to find *M. athalia* in Abbott's Wood, near Hailsham. After about an hour's work I ran across two other collectors on the same hunt. We joined forces. In a swampy meadow in the wood we found a professional looking for what he called "Dark Greens." On inquiry about *M. athalia* brought the reply that it was quite extinct in Abbott's Wood, and that where we then were was the old spot for it. Feeling somewhat doubtful after my former experience, I wandered up one path and down another until my feet ached. No luck again, on the 23rd no luck, likewise on the 25th and 30th, but on July 21st a worn female. Last year (1919) I renewed the search, and I found sufficient to say that *M. athalia* is far from extinct in Abbott's Wood.—E. CRISP; Heathcote, Heathfield, Sussex.

PIERIS MANNI AND POLYGONIA EGEA AT CANNES.—*Pieris manni* has been plentiful again this autumn at *Passerape lepidium*, but they were worn out. I took last week a few larvae with *P. rapæ*. Both the spring and autumn emergences of *P. manni* are small, the large form *rossii*, Stefan., being of the generation between them in summer when we are away. The reversion in cool weather is curious, and is the same in *Pontia daplidice* and *P. daplidice bellidice* and in *Euchloa ansonia matutina* (*belia*, Auct.) and *E. ansonia turatii* (*ansonia*, Anet.), which is larger than the former. For the first time we have succeeded in finding pupae of *Polygonia egea j-album* on old walls, and have five out. I wanted both forms badly—all mine are old hibernated examples—but, alas, five other pupae were killed by the cold wind and hot sun, and all died just when they should have emerged. I try to imitate natural conditions as much as possible, but the weather is so changeable here this season, with sudden bitter winds, that one must always be on the spot to regulate matters. The last pupae were taken alive on Sunday last, November 9th, but two died in two days, although we pinned them up on warm sheets of peat, wet the back of them, and let the sun warm them through from behind.—C. E. MORRIS: Le Cannet, Alpes-Maritimes, November 13th, 1919.

NOVEMBER EMERGENCE OF NEMEOBIUS LUCINA.—I have to record the emergence from pupæ on November 1st last year of a female specimen of *N. lucina*, which I reared from larvæ.—ARTHUR JONES; 17, Sea View Road, Gillingham, Kent.

[The specimen recorded above was kindly sent to me, and as it was quite limp when received has been set for the cabinet. In reply to my letter of November 8th Mr. Jones writes: "A friend, knowing

nothing of entomology, sent me four wild larvae of *N. lucina* from Hastings on June 20th, and I fed them on the leaves of primrose in a room of 50° to 55° and kept them in the same room, and they all pupated on July 29th. About a month ago I moved them to another place in the same room with other pupæ, and when I was putting a few *S. carpini* (*paronia*) in the box I saw that the *lucina* was emerging. I am sending you one of the pupæ, also the case from which the insect emerged, so that you might see that it is nothing but an ordinary-sized one."—R.S.]

FURTHER NOTES ON "PARTHENOGENESIS" IN *LYMANTRIA DISPAR*.—In continuation of my notes on a case of parthenogenesis in *Lymantria dispar* in 'Entomologist' for July, p. 166, I think the few notes I have may be of interest. The larvæ, about 100, were very healthy and grew rapidly. I gave away most, keeping about thirty-six for myself. These all pupated and eventually emerged, twenty-six males and twelve females. All were perfect specimens, quite up to size and coloration. I kept three or four females separate in a cage without a male, but all died without depositing any eggs. I allowed one to pair, and she at once commenced to lay her eggs and continued to do so for five days, covering them as usual with scales from her abdomen and then died. The pupæ were enclosed in a very flimsy net more than cocoon—in fact the net was so slight that two fell out of it. I do not know if the disparity in males and females is normal—that is 2 to 1.—R. H. RATTRAY (Col.); 68, Dry Hill Park Road, Tonbridge, November 10th, 1919.

NOTE ON *BRYOPHILA ALGÆ*, FABR.—This very interesting species is only recognised as British by two examples, both captured by a workman (name unknown), in July, 1859, at Lyme Park, Disley, Cheshire, who either presented or sold them to the late Mr. Robert S. Edleston of "The Firs," Bowdon, Cheshire. Upon his authority the following announcement was made, in the pages of the 'Entomologist's Weekly Intelligencer' for 1860, p. 11. "Two specimens of this pretty species (*B. algæ*) were taken in the Manchester district last July." Disley is about fifteen miles from Manchester. I recollect seeing these in his collection in 1870. Two years later he died, and in 1872-73 his cabinets and their contents were disposed of privately. Mr. Joseph Sidebotham (d. 1885), a near neighbour and friend of Mr. Edleston, and whom I also knew intimately, was, I believe, one of his executors, and purchased a large portion of the Lepidoptera, including one of the two *B. algæ*. This I examined lately at the Manchester Museum, as the Sidebotham Collection—an exceedingly fine one—has been generously presented this year to that institution by his eldest son, Mr. J. Sidebotham, formerly M.P. for the Hyde Division of Cheshire. Though not in very perfect condition, it is quite recognisable, and is undoubtedly correctly determined. The label attached to it reads, "Lyme Park, 1859." I have compared it with European specimens. It is dullish green in hue towards the basal half of the fore wings, and otherwise suffused with a broad blackish band, thus being intermediate between the typical form *spoliaticula*, Hübner, and the variety *degener*, Borkh. The species is figured in Duponchel, vi, pl. lxxvi, figs. 5, 6; in W. F. Kirby, 'Butterflies and Moths of Europe,'

pl. XXXIV, fig. 2 (1908), and A. Seitz, 'Macrolepidoptera Palaearctica,' iii, pl. x, figs. 5 (typical), 6 (var. *degener*), also E. Newman, 'Brit. Moths,' p. 247 (1869), and F. O. Morris, 'Brit. Moths,' pl. xli, fig. 2 (1862). Of the whereabouts of the second specimen I have no precise information. At the sale of Dr. P. B. Mason's large stores in 1905 an example was sold as from "Prest's Collection" (lot 401 in the second day's sale, March 15th). It is possible these may be identical. I may add that the generic name *Metachrostis*, Hübner, 1816, antedates the better-known *Bryophila*, Treitschke, 1825, by nine years. Having been lately staying a good deal in the neighbourhood of Disley, though I have not had the good fortune to see any species of *Bryophila* settled on the numerous tree-trunks or stone walls in this locality, I have, notwithstanding, come to the conclusion that a more likely or suitable environment could not exist for this rare moth. The air, often laden with moisture, causes a confervoid growth to flourish on the grey limestone of the walls, and the dark-green wings of *B. alpe* would blend favourably with the general coloration. I have no reason to disbelieve the fact of the original captures being quite genuine. The known geographical distribution is entirely consonant with the probability of its being found in Great Britain. Staudinger and Rebel (1901) give "Europa centr. et mer: Asia minor, America, Ussuria, Japonia" as localities, and Guenée particularly mentions its being common around Paris. This note, therefore, is written mainly to urge entomologists to search this neighbourhood well, with the probability that the prize may be again secured, and the species once more confirmed and reinstated as a true native of these islands.—J. COSMO MELVILLE; Meole-Brace Hall, Shrewsbury.

MELLINIA OCCELLARIS AT TONBRIDGE.—On the night of September 30th this year I was lucky enough to take a fine specimen of *Mellinia ocellaris* (the Pale-lemon Sallow) at sugar in my garden. It was a female and in fine condition. There are a large number of poplar trees all round the garden, but I have never seen the moth here before. R. H. RATTRAY (Col.); 68, Dry Hill Park Road, Tonbridge, November 10th, 1919.

ACOSMELIA CALIGINOSA IN THE ISLE OF WIGHT.—I see in 'Moths of the British Isles' that *A. caliginosa* was found formerly in the Isle of Wight. I had the good fortune to find the species again here in some quantity, but very local, being confined almost to one portion of a field near a wood. I must have netted about thirty on June 5th last, including some females, but only two were good specimens.—W. GODFRAY (Lt.-Col.); Gadshott Park, Godshott, Isle of Wight.

AMPHIPYRA TRAGOPOGONIS IN DECEMBER.—I took a female specimen of *A. tragopogonis* on December 1st last year. I do not know whether this is unusual, but it appears to me to be a remarkably late date for the species, particularly as there was heavy rain all that day following a severe frost. Personally I have no specimens in my collection taken later than September. The moth (as might be expected) was much worn. N. O. R. SERJEANT; Loyer Marney Rectory, Kelvedon, Essex.

BOARMIA REPANDATA, ETC., IN THE RANNOCH DISTRICT.—Perhaps the most interesting event that occurred to me amongst the Macro-

lepidoptera during several weeks spent in the Rannoch district last summer was a single example of *Boarmia repandata*, var. *nigricata*, which turned up at sugar. I mention this because the usual form is at present the grey one, var. *sodorensium*, and assuming the increase of the black form var. *nigricuta*, it may be interesting to note the date of its genesis as Rannoeh. The only good Noctuid at sugar was *Aplecta occulta*, which turned up in some numbers.—W. G. SHELDON.

PERIZOMA TÆNIATA IN SOUTH DEVON.—On August 1st last year I captured a specimen of *P. tæniata* on the coast of Torbay. It flew out of a thick hedge which was being beaten for Geometridæ. The insect is in good condition, but the left fore wing is slightly crumpled. The species has been previously recorded from Lynton in North Devon, but so far as I know not from South Devon.—F. C. WOODFORDE; 19, Friars' Entry, Oxford.

LEPIDOPTERA IN THE HIGHLANDS.—In the course of six weeks' holiday in August and September, 1919, in the neighbourhood of Aviemore and Nethybridge, I found Lepidoptera very scarce indeed; but I took one specimen of *Depressaria (Pinaris) hepatariella*, Zell., at Kingussie on August 28th. Mr. J. Hartley Durrant, who kindly determined it for me, informs me that only one or two other British captures of this species are recorded. The only common species were *Eupithecia sobrinata*, *Pædisca solandriana* and *Steganoptycha geminana*, all of which were to be seen in large numbers. Of *E. sobrinata* I took a number of striking grey and black varieties (the relative proportions and depth of the two colours showing the widest variation), as well as a few specimens of the browner southern form, which occurs not uncommonly in the Isle of Purbeck and elsewhere. *P. solandriana* also presented every variety, one of the commonest being var. *cespitanata*. One specimen of *S. geminana*, light grey in ground-colour, showed no trace of a basal patch, but a bold, lozenge-shaped black marking in the centre of the wing.—A. W. PICKARD-CAMBRIDGE; Balliol College, Oxford.

SPHÆRŒCA OBSCURANA, STEPH. = RAVULANA, H.S., AT TILGATE.—Tilgate Forest is an old locality for this rare species, but I am not aware that it has been taken there for many years, probably because it has not been systematically worked for. I gather that but few specimens were taken altogether, and that most of them fell to the net of that particularly energetic collector, E. G. Meek. I had long thought I would like to try my luck with this difficult to obtain species, and last June I did actually capture half-a-dozen examples there—one on my first attempt and five on my second.—W. G. SHELDON.

NOTES ON A HOLIDAY IN ESSEX.—On August 2nd myself and family went to spend a holiday at Burnham-on-Crouch, Essex, with the intention (my eldest boy and self) of making as much, entomologically, of the holiday as we could. The weather was all that could be desired, with brilliant sunshine, and whilst out on the rough heathland adjacent to the town we saw what at first sight appeared to be a large fritillary flashing past in the sunshine. Our first attempts at capture were hopeless failures, the insect possessing astonishing speed. A lucky stroke, however, at length stopped its flight, and we found our capture to be *Lasiocampa quercus* in fine

condition. Attention paid to this locality during the week gave us a very interesting insight into the habits of the "Oak Eggar." The atmospheric conditions were apparently quite the same from 12 o'clock to 3 p.m., but on no occasion did the insect put in an appearance before the latter hour. From our elevated position we could see for quite a distance in every direction, and it was most interesting to notice how he flew — always in a circle of about a quarter of a mile, his motions, strangely like those of a bat, being discernible for the whole length of his flight. Not only did they keep to the same route, even if driven from it temporarily by our nets, but they would use the same passage through a hedge, which enabled them to keep to open ground, our method of capturing being to station ourselves by the gap and swoop down at the psychological moment as they attempted to "force the pass," the net result being eight fine specimens. During the same period we took from a fence a fine full-fed larva of the same species, presumably one which had fed up from the ovum during the same year and which is now in pupa. In the evenings we went in search of the female, but were only successful in securing one specimen, but at the same time took several examples of *C. potatoria*. Our other captures included eight larvae of *S. pavonia* off bramble, as well as imagines of *Epinephele tithonus* (a beautiful series), *C. argiolus*, *P. atlanta*, *C. matura*, *T. ianthina*, *C. nupta*, *A. rumicis*, *P. megera*, etc.—C. WAINWRIGHT; 8, Kingsdown Avenue, West Ealing, W. 13.

LEPIDOPTERA IN MESOPOTAMIA.—I have lately returned from Mesopotamia, and although I had little time to devote to collecting entomological specimens I managed to bring back a certain number, as the following list will show. The total species of Lepidoptera met with in this desert country was not great, but I was surprised at the vast number of species of Coleoptera which another officer collected — many of them new to science. The principal moths were: *Icherontia atropos*: One obtained at Beit Naama. *Deilephila livornica*: Found in vast numbers at dusk and also in broad daylight around nasturtiums and orange-blossoms at Beit Naama during April. A few were attracted by light in March. *Chærocampa celero* was also obtained in vast numbers around the same blossoms during April. *C. nerii*: On March 27th I found numbers of specimens at orange-blossoms, and although I had no net I caught many each night up to April 1st, after which date none were seen. *C. alecto*: These were common during April at Beit Naama round nasturtiums and several were captured. *Macroglossa stellatarum*: Very common at Beit Naama during April. *Uteheisa pulchella*: A few obtained. *Pseudaletia quinaria* and *P. moneta* were both fairly common. *Leucanitis nubera*: Very common everywhere. *Eriogaster rimicola* was found commonly in Baghdad. With regard to butterflies there are many I am unable to record, as I have not yet identified them. But the following list is fairly complete: *Papilio machaon* was met with at Tigris and north of that town. *Tharsis errisyp*: One or two specimens only. *Ponis chlorinice*: Very common in the Hamrin Mountains and elsewhere, and some good variations obtained. *P. brassicæ*: A few obtained at Busrah. *P. rapæ*: Met with sparingly throughout

Mesopotamia. *Colias edusa*: Fairly common throughout. *Pyrameis cardui* was vastly common everywhere. *P. atalanta*: Fairly common. *Vanessa io*: One or two met with. *A. urticæ*: Also common. *Hipparchia semele* (?): One specimen obtained and several seen. In addition one or two Blues and two species of Skippers were very common. These seemed to be continuous broods of one Blue all the summer, the larvae living on vine.—H. F. STONEHAM (Capt.), F.E.S., M.B.O.U., etc.; Stoneleigh, Reigate, September 1st, 1919.

MOTHS CAPTURED BY LIGHT-TRAP.—In August, September and November, 1914, Mr. Prideaux, on my behalf, published in the 'Entomologist' a description of a moth trap and the results obtained with it during that year. The house I then occupied was situated on the chalk hills to the north of the Brasted Valley, with a considerable view from the windows. This year (1919) I have again made use of the trap from my present house, on the outskirts of Sevenoaks, from which there is little or no view. Although the results have been nothing like as good as far as the number of moths that entered the trap are concerned, the number of species taken has not been far short of those taken in 1914, and it may possibly interest your readers to have the list of the species taken. May (trap run on 4 nights from 10 to 3): *A. mendica*, *C. unidentaria*, *L. marginata*, *H. jacobææ*, *P. curtula*, *C. glaucata*, *S. menthastræ*, *S. lubricipedæ*, *P. bucephala*, *A. puta*, *D. coryli*, *D. pudibunda*, *P. tremula*, *L. camelina*, *D. vinula*, *D. falcataria*, *G. bidentata*, *Eupithecia vulgata*, *C. ferrugata*, *X. fluctuata*, *C. designata*, *O. luteolata*, *M. ocellata*, *E. silaceata*, *P. dictæoides*, *A. segetum*. June (trap run on 6 nights): *M. dentina*, *G. trigrammica*, *L. comma*, *N. rubi*, *A. basilinea*, *A. corticea*, *M. olearacea*, *N. primulæ*, *P. chrysitis*, *L. pallens*, *D. scabriuscula*, *C. taraxaci*, *R. tenebrosa*, *E. lucipara*, *A. gemini*, *X. monoglypha*, *X. montanata*, *T. bistortata*, *P. pulchrina*, *C. pusaria*, *C. corylata*, *P. albulata*, *L. associata*, *B. roboraria*, *H. syringaria*, *O. sambucaria*, *N. augur*, *S. populi*, *N. plecta*, *M. strigilis*. July (trap run on 7 nights): *A. nebulosa*, *N. brunnea*, *P. arcuosa*, *M. persicariæ*, *N. triangulum*, *B. perla*, *P. similis*, *A. simulans*, *P. moneta*, *A. megacephala*, *B. viminalis*, *B. brassicæ*, *N. cucullatella*, *L. lurideola*, *N. neustria*, *L. lithargyria*, *C. matura*, *H. proboscidalis*, *M. bicolorata*, *Eupithecia pulchellata*, *A. immutata*, *P. alchemillata*, *B. gemmaria*, *S. bilunaria*, *H. furcata*, *G. papilionaria*, *A. virgularia*. August (trap run on 8 nights): *H. nictitans*, *M. miniata*, *B. lacertinaria*, *A. caia*, *P. gamma*, *C. graminis*, *H. micacea*, *E. meticulosa*, *O. sambucaria*, *Z. grisealis*, *E. fuscantaria*, *C. elinguaria*, *A. pyramidea*, *L. testacea*, *E. popularis*. September (trap run on 3 nights): *T. cespitis*, *X. flava*, *O. cervinata*, *E. alniaria*, *C. spartiata*. October (trap run on 1 night): *A. lychnidis*.—FREDERICK GILLETT (Major); Cheriton, Sevenoaks.

OBITUARY.

THOMAS DE GREY, D.L., F.R.S., F.E.S., ETC., SIXTH BARON
WALSINGHAM, 1843—1919.

It is with deep regret that we have to announce the death of Lord Walsingham, a sportsman, naturalist of the foremost rank,

and a specialist in the Microlepidoptera without equal in the ranks of modern entomologists. From his earliest days of interest in science, after leaving Eton and Trinity College, Cambridge, of which University he was appointed High Steward in 1891, he never wearied in allegiance to the great family of Lepidoptera, with which his name will always be associated. His achievements therein are commemo-rated in many monographs and papers dealing with the subject, and finally enshrined in the magnificent Walsingham Collection and Library presented by him to the Natural History Museum on April 1st, 1910. The collection, besides thousands of specimens collected by himself, includes those of Zeller, Hofmann and Christoph, and is certainly one of the most complete—if not the most complete

in the world. Lord Walsingham, indeed, maintained his interest in the group down to the last days of his life. A member of all the most important entomological societies, he joined the Entomological Society of London in 1866, and was, with two exceptions, I think, the oldest elected Fellow on the list. In the years 1889–90 he was President, and Vice-President during several years, his last term of service on the Council being in 1896. During the present century he lived much abroad and was less often seen at the Society's meetings. But he maintained his interest in its work and proceedings, and especially in the men who concentrated upon the aspects of entomology which are rather those of the field than the museum. His own field-work in sport and science covered an immense area, commencing overseas with a visit to California and the Western States of America, later extended to North Africa, Andalusia, Corsica, and the South of France where he had a villa. To entomologists of all orders he was equally sympathetic, and the writer of this notice remembers him also as the most generous of men where assistance was needed for naturalists who had met bad fortune. In his time a foremost figure of society, a shot without rival, a writer on sporting subjects accurate and entertaining, his energies found useful outlet also in the multifarious public duties and trusts imposed upon him. Apart from his fellow- and membership of learned societies innumerable he was a trustee of the British Museum, the Hunterian Museum and the Lawes Agricultural Trust. It was in the performance of his duties as High Steward of Cambridge University that he caught the chill which terminated his long and useful career, and those who were privileged to know him in his private as well as in his public life may well ask when we shall "look upon his like again"? Though he belonged to the older generation of lepidopterists he moved with the times, and his loss will be as keenly felt by the younger generation of scientists as by the men who have been his contemporaries. Lord Walsingham was twice married, but he leaves no heir; the title, therefore, devolves on his half-brother, the Hon. John de Grey, until lately a London police magistrate.

H. R.-B.

With great regret we have to announce the death of Mr. T. B. Billups on December 10th last. A further notice will appear in our next issue.

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THE LIFE-CYCLE OF *LOBESIA PERMIXTANA*, HÜB.

By W. G. SHELDON, F.Z.S., F.E.S.

THERE has been a considerable amount of controversy and speculation respecting the earlier stages of this beautiful little Tortrix, which has not hitherto been entirely solved. So long ago as 1874 Barrett, 'Ent. Mo. Mag.', xi, p. 62, discusses it and states that it seems partial to oak. In the same magazine, vol. xxiv, p. 58, Stainton writes on it, and after discussing nomenclature treats of life-history; he says: "Jourdheuille in the 'Ann. Ent. Soc. France,' 1870, p. 127, says of it larvæ on *Anchusa officinalis*"; he then goes on: "Brischke in 'Stett. Ent. Zeit.,' 1876, p. 68, says that he bred *L. permixtana* from a larva found August 21st, 1871, in the tips of the stems of *Solidago virgaurea*." Stainton follows with his own experience, and says that on June 10th, 1887, he "found *L. permixtana* at Pitlochry in a wood of mixed growth—oak, birch, mountain ash, etc.—and that it seemed partial to oak, although he thought *Solidago virgaurea* did occur." The next contribution is in 'Ent. Mo. Mag.,' xxv, p. 66, and is from the pen of that excellent observer Dr. J. H. Wood, who writes that "in July, 1887, he was beating sloe bushes on the outskirts of a wood and that there fell into his umbrella two small, dark, extremely active larvæ, quite unlike anything he had ever seen before." A moth of this species resulted from one of these larvæ on May 20th of the following year; then follows a description of this larva. In vol. xxxi, p. 159, Dr. Wood further announced that "birch (*Betula glutinosa*) was a food-plant also, he having on several occasions obtained it from that tree." One is uncertain what tree Wood actually means; the common birch is, of course, botanically *Betula alba*; and whilst there is no species of this genus which has a specific name *Glutinosa* the nearly allied genus *Alnus* has a species, the common alder, *A. glutinosa*. It is, of course, impossible to say which of these two species Wood meant. He further says "a suggestion thrown out that it may feed upon oak is therefore likely enough to come true."

There can be no doubt but that the imago has a strong penchant for oak. Barrett, 'Lep. of Brit. Isles,' xi, p. 249, writes of it: "The moth flies in a very lively manner over small oak and other trees, and oak bushes, in the late afternoon and early evening," and this is the common experience of everyone I have spoken to about it.

In early June, 1915, I became aware that *L. permixtana* was abundant in a portion of Limpsfield Chart, the undergrowth in which had been recently cut down. This growth consisted solely of oak and birch, the ground underneath being covered with bilberry and *Calluna vulgaris*. The moths seemed almost entirely to frequent the oak bushes, which were two to three feet high. It was not until 1917 that I thought of capturing females to see if I could get ova; in this year I did not have any success. The following summer, June 4th, from some further captured females I did succeed in obtaining a few ova, which were deposited on an oak leaf, chiefly on the upper side, but there were a few on the underside.

The ovum is very large for the size of the moth, being about .5 mm. by .4 mm., in shape oval, horizontal, of course. The colour is greyish-green, somewhat opalescent, surface glabrous but rough, and very thickly pitted over with very small sinkings of irregular shape. A nucleus is distinctly visible, which is somewhat darker in tint than the surrounding envelope; this nucleus represents about 80 per cent. of the area of the ovum. On June 12th the larva was distinctly visible, it was curled round in the ovum, and was light greyish-green in colour, with a black head.

The larva only emerged from one of the ova; this took place on June 13th. It was then about .2 mm. long, whitish-green in colour, the head was glabrous, and dark fuscous; the prothorax was whitish-green with a dark fuscous line at the rear, and in the centre of the dorsum; the larva was very spiny.

I supplied it with three oak leaves, and an oak bud, as I had an impression that it fed naturally in the bud; it also had a birch leaf to choose from. The oak leaves were placed one upon the other—an arrangement I find very much to the liking of leaf-eating Tortrix larvae; it immediately commenced to feed upon them, spinning together a portion of two of the leaves which lay closely one upon the other.

On June 26th the second instar was reached. The larva was then 2.50 mm. long; the head and prothorax were amber-coloured; both were glabrous. The segments behind the prothorax were dark greyish-green in the dorsal, and light grey in the spiracular areas; the larva was very transparent. It lived between two leaves, feeding upon the lower cuticle of the upper one.

On July 7th the larva was in the third instar; it was now 5 mm. long, slender, the head was amber-coloured with dark brown shading around jaws, glabrous and transparent; at the

rear it had two very distinct lobes. The rear half of the prothorax was the same colour as the head; the front half was much paler. Next the mesothorax are two half-crescents, dark brown in colour, divided in the centre by a thin line of light colour. The segments at the rear of the prothorax are light honey-coloured and very transparent. There is an unusual arrangement of colour in the dorsal regions; this includes the whole of those from and including the rear portion of the prothorax, and all the segments at the rear of it with the exception of the last four. This colour is dark brown, and it is continued to its anal extremity of the same width.

The tubercles are slightly lighter than the surroundings, but are not prominent. The spiracles are slightly darker than the adjoining area; they are not conspicuous. The claspers and prolegs are dark fuscous. The alimentary canal shows as a distinct dark line through the brown dorsal area, but is hardly visible at the rear of it. The anal plate is not noticeable.

On July 13th the larva was 9 mm. long, apparently still in the third instar; it was now very similar to when last described, with the exception that the anterior segments were now almost as dark as those in front of them. On this day I put in the cage a dead beech leaf for it to pupate in. A few days afterwards I found that it had neatly folded over a small portion of this leaf, and spun a white silk cocoon in the pocket so formed. I fancy it changed to a pupa a few days afterwards, but as I had only one example, and until it actually emerged I was uncertain whether it was *L. permixtana* or some other species that had deposited its ova on the oak sprays over which I had confined the females, I did not care to take the risk of opening the cocoon and killing the inmate.

I did open this cocoon on the following 4th of April, and found in it a pale amber-coloured chrysalis. My doubts were set at rest by a fine male *L. permixtana* emerging on May 15th last.

The larva throughout was one of the most active I have ever seen amongst the Tortricidæ, jumping and wriggling about in a most remarkable manner.

In the last instar I introduced to it a leaf of Golden Rod; this leaf was spun to the only oak-leaf then in the tin in which I kept the larva, but it was not fed upon. It will thus be seen that I have no evidence to offer in support of its feeding upon either this plant, or upon birch, which Dr. Wood found the larvæ upon, but my experiments were hardly extensive enough to be conclusive.

Youlgreave, South Croydon;
December 9th, 1919.



ABERRANT FORMS OF *ARCTIA CAJA*.

By LEONARD TATCHELL, F.E.S.

THE upper specimen shows great encroachment of the dark colour over the light on fore wings, with spots confluent, the usual red replaced by pinkish orange on hind wings.

The lower specimen is melanistic with almost all traces of the cream ground-colour obliterated on fore wings, with spots of smoky hue coalesced in the hind wings and showing only a very slight amount of the red. There is also a distinct darkening of the abdominal segments.

These specimens were bred from full-grown larvae collected near Bedford.

[For figures of other aberrations of *A. caja*, see the 'Entomologist,' vol. xxi, p. 73; vol. xxv, p. 1; vol. xxix, p. 1; vol. xxxii, pl. iii, fig. 9; vol. xlix, p. 264.—ED.]

A FEW NOTES ON CRIMEAN LEPIDOPTERA.

By V. V. NABOKOFF.

RUSSIA offers a wide and fruitful field of research to the entomologist. Just as in its north-western part the Scandinavian and Central European fauna mingle together, producing in the same place species of quite different haunts, such as *Brenthis freija* and *Apatura iris*, *Eneis jutta* and *Pontia daplidice*, Crimea, from the zoological point of view, seems to be the connecting-link between the Balkan and Caucasian districts. The region of steppes in the north of Crimea (districts of Eupatoria, Perekop, and partly of Simferopol and Theodosia) forms geographically a continuation of the so-called Novorossian steppes and is distinguished by the very same peculiarities—lack of water, scanty vegetation, and, moreover, extreme heat and dryness in summer, snow-storms in winter. Only for a short time in spring these plains are covered with flowers, and the fresh grass delicately waves in the soft sunshine. The steppes, gradually ascending, form in the south a chain of mountains stretching from Theodosia to the Cape of Khersones. On the gentle northern slopes, facing the barren plain, begins the woodland (oak, beech, lime, elm, ash, mountain ash, poplar, willow, etc.). Southwards, on the steeper side, the commonest tree is a Crimean variety of *Pinus sylvestris*, while further on, in the narrow space between the mountains and the sea, cypress, pomegranates, laurel, olive and fig trees give a touch of Italy to the landscape. Few interesting insects occur, however, in the beautiful gardens and parks of the coast. My chief collecting-grounds were the rocky southern slopes of the mountain Ai Petri and the Yaila—hilly pastures on the northern side. Moreover, I made half-a-dozen excursions to the central part of Crimea. I give below a list of butterflies noted from November, 1917, to August, 1918.

HESPERIID.E.

Carcharodus alcææ: Very abundant everywhere, in two broods.
C. lavateræ: A few specimens captured in May. *Hesperia carthami*: One female, May 20th, at the foot of Ai Petri. *H. alveus* (? *armoricanus*, Obthr.): Common in June on the Yaila. *H. malvæ*: Appeared April 10th. *Pyrgus proto*: One male, August 7th, near Bakchisarai. *P. orbifer*: Appeared April 19th. The most abundant of all. *P. sao*: Appeared May 20th. Scarce. *P. protheon*: A beautiful female, July 13th, in a pine-wood. *Nisoniades tages*: 1st gen. April 13th, 2nd gen. June 60th. *Augiades comma*: Abundant in August in Central Crimea. The females are very dark. *A. sylvanus*: Appeared May 31st. *Adopæa flava*: Appeared May 30th.

LYCENID.E.

Chrysophaeus thersamou: I captured only two examples—a tattered one of the 1st gen., June 7th, and a fresh one July 3rd. Both are males. *C. phleas*: Scarce.

Plebeius argon: One male, June 18th. *Scolitantides orion*: First seen June 27th. Rare. *S. baton*, var. *clara*: Appeared April 13th. Very abundant in some places. *Aricia medon*, var. *sarmatis*: Appeared April 23rd. Common everywhere. *Polyommatus icarus*: Very abundant in several broods. *Agriades bellargus*: First seen May 27th. Common in fields at the foot of Ai Petri. Large specimens. Males tinged with purple—very different from the western ones. *A. meleager*: Appeared June 18th. Very abundant. In the southern part of Crimea the females are ab. *steeneui*; on the plains of the inland, typical. *A. corydon*: Appeared June 30th. *Cupido minimus*: One, June 3rd, at the top of Ai Petri. *Nomiades semiargus*: Appeared June 27th. *N. cyllarus*, var. *aeruginosa*: Appeared June 30th. Common for a short time in parks. *Lyceea euphemus*: In woods of the inland. *Thecla w-album*: Plentiful in beech-woods. Once, on a sunny day, I found scores of specimens settled on some nettles. When disturbed they flew off, but immediately returned again to their resting-place. *T. acacie*: First seen, June 18th. Abundant here and there, on lawns, fluttering about like a small *Lyceea*. Some specimens seem to be var. *abdominalis*. *Callophrys rubi*: Appeared April 16th. Large specimens. Under-side pale green, with only one white dot—the lower one—on hind wings. *Celastrina argiolus*: 1st gen. March 27th, 2nd gen. June 9th. The commonest butterfly in spring.

PAPILIONID.E.

Iphiclus podalirius: Plentiful in gardens. First brood appeared at the end of March, the second at the end of June. Worn specimens of the first generation were on the wing as late as June 15th. *Papilio machaon*: I captured only one example (June 3rd). In this specimen the two upper lunules on the outer margin of hind wings are tinged with orange. This is an unusual aberration.

Parnassius apollo, var. ?: Said to occur near Simferopol. I have seen specimens in local collections.

Thais polyxena: Abundant on the plains of the inland in March. I have not noticed it in the south of Crimea. This also refers to the next species.

PIERID.E.

Aporia crataegi: Two faded females, July 18th. *Pieris rapae*: 1st gen. April 1st, 2nd gen. June 16th. *P. napi*: 1st gen. March 27th, 2nd gen. June 2nd. *Poutia daplidice*: 1st gen. March 23rd (ab. *bellidice*), 2nd gen. June 10th.

Euchlöe belia var. *uralensis*: In one gen. First appeared April 6th. This is a common butterfly in the parks and gardens of the coast. *E. cardamines*: Appeared March 3rd.

Leptidia sinapis: 1st gen. March 23rd. The males have pale grey tips and the space between the inner margin and vein vii on the underside of hind wings is suffused with greyish-green, which reminds me of *duponcheli*. That species, as much as I know, has never been observed in Crimea. 2nd gen. July 3rd. Black tips and very pale—nearly white—underside of hind wings, ab. *diniensis*?

Colias hyale: Single specimens throughout the summer. I have a couple of males in which the dark markings are nearly absent. *C. edusa*: Extremely abundant from March to late November, in several broods. Ab. *pallida* (*helice*) and intermediate forms are frequent.

Gonepteryx rhamni: Appeared June 20th, but was rarely seen. Much more abundant in the spring.

NYMPHALIDÆ.

Dryas paphia: Not common. *D. pandora*: Appeared June 30th. Abundant for a week or so near Yalta. It was delightful to watch, as it sailed to and fro, over roadside thistles.

Argynnis aglaja: One specimen, July 13th, on a mountain road. *A. adippe*: One male (ab. *cleodoxa*), June 2nd.

Issoria lathonia: 1st gen. April 10th, 2nd gen. June 6th.

Brenthis dia: Appeared June 3rd. Scarce.

Melitæa cinxia: Appeared April 28th. *M. didyma*, var. *neæra*: 1st gen. June 7th, 2nd gen. August 1st. Abundant with *cinxia* on mountain slopes. A pretty, well-defined variety. *M. athalia*: In woods on the northern side of Ai-Petri. Small, dark specimens.

Pyrameis cardui: A great quantity of fresh specimens appeared April 26th, and then again June 6th. It is the most abundant butterfly in Crimea. In August on the plains of the inland it is to be met in thousands—the only butterfly for miles around. *P. atalanta*: Very common, too, chiefly in spring. On sunny days in winter I have noticed numerous examples sailing and fluttering among oak-trees. *Vanessa io*: Now and then in gardens. *Aglais urticæ*: Abundant on the Yaila. Fine, warm-coloured specimens. *Eugenia xanthomelas*: One male July 2nd. *E. polychloros*: Plentiful in parks.

Polygonia c-album: Rarely seen. *P. egea*: One female February 2nd, in a Tartarian village on the coast.

LIBYTHEIDÆ.

Libythea celtis: 1st gen. March 23rd, 2nd gen. June 9th. Abundant in gardens and on the outskirts of pine-woods at the

foot of Ai Petri. It flits and glides over bushes, somewhat resembling a *Melitaea maturna*, often settles with closed wings on twigs and stones, and has a habit of darting in unexpected directions when pursued. Examples of the second generation are of a deeper orange hue with darker and stronger markings, which give the butterfly when on the wing a bluish-black, glossy appearance.

SATYRIDÆ.

Pararge vernalis: I saw one male June 20th, in a park by the sea. *P. megaera*: 1st gen. April 13th, 2nd gen. June 30th. *P. egeria* var. *intermedia*? : 1st gen. March 31st, 2nd gen. June 27th. Common in shady nooks. Much paler than the Mediterranean form, but not quite so pale as the northern variety.

Satyrus ciree: Appeared June 18th. *S. anthe*: One specimen, a fresh but somewhat deformed female, in a mountain gorge July 13th. *S. statilinus*: Very abundant everywhere in autumn.

Hipparchia semele: Appeared June 1st. Very common. The females are exceedingly large. *H. hippolyte*: July 13th, at the very summit of Ai-Petri. Gently flutters among rocks, often settling with closed wings on the ground. The examples I obtained are bigger and brighter than Andalusian specimens.

Enodia dryas: Common in central Crimea. I captured some fine specimens in August near Bakchisarai—the former residence of the Khans.

Epinephele jurtina: Appeared May 16th. *E. lycæon*: Appeared June 23rd. Very common in the mountains. Small examples.

Cronynympha pamphilus: Very scarce.

Erebia afra: I found this butterfly locally abundant on the Yaila June 3rd. There were no males about and most of the females were faded. They rise from out of the grass when disturbed, float for a short time in the wind, and languidly drop again with outspread wings on stones and blossoms. This butterfly, when flying, bears a striking resemblance to *E. janira* ♂.

Melanargia galatea: Appeared June 9th. Very common in grassy places at the foot of Ai-Petri. Ground-colour of underside of hind wings ranges from pearly-white to ochre-yellow.

This makes 77 species in all. It is obvious that many others are found in Crimea, for I have included in this list only those that I have seen myself. The absence of *Pieris brassicæ* is strange, while on the other hand I was disappointed in not finding *H. curinus*—a new species lately described by Kuznetzoff. My collection, which, unfortunately, I was compelled to leave in Yalta, includes also about a hundred different species of moths, many of which are unknown to me.

Sphinx convolvuli, *Daphnis nerii*, *Deilephila livornica* and *D. euphorbiæ* were all common at dusk on honeysuckle. *Pterogon gorgoniades* also occurs now and then near Yalta. On June 3rd I detected a fine female on a window-pane. When at rest with protruding hind wings it resembles a very small specimen of that handsome grey-marbled moth *Smerinthus tremulæ* (*amurensis*, Stdr.), which, in happier days, I used to find at the foot of aspens in the neighbourhood of Petrograd. Among other interesting things I may mention *Acronycta pontica*, *Gnophos stenaria* and *Endagria salicicola*, a pearly-white, black-dotted little moth that is confined to the shores of the Black Sea.

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ENTOMOLOGICAL SEASON OF 1919 IN SOUTH HANTS AND SOUTH DEVON.

By A. E. BURRAS, B.A.

THE following summary of the past season based on field work done in South Hants and South Devon may be of interest to other entomologists. The results of this work have led me to conclude that the season just ended has been, not exactly the worst, but the most peculiar for many years. According to my experience the outstanding feature of the season has been the remarkable scarcity of certain usually common species. This scarcity has manifested itself throughout the period, from spring "sallowing," through summer "sugaring," to autumn "ivy-hunting," and generally to larvæ-beating throughout the year. To this tale of scarcity, however, there are certain remarkable exceptions. In the spring, larvæ, which had hibernated, were quite up to the average in numbers.

In South Hants and the New Forest *Argynnis cydippe*, *Dryas paphia* and its variety *valezina*, *Aphantopus hyperanthus*, *Limenitis sibylla* and *Pararge egeria* were plentiful. Larvæ of *Zephyrus betulae* were not scarce, whilst, on the other hand, those of *Zephyrus quercus* were quite remarkably so. Imagines of *Callophrys rubi* were abundant, whilst on the same ground those of *Nemeobius lucina*, usually the more plentiful species, were not even seen. At sugar in the New Forest *Grammesia trigrammica* was the only plentiful species; *Catocala sponsa*, *Catocala promissa* and even *Calymnia trapezina* were almost entirely absent. *Plebeius aegon* in the New Forest was scarce. Of our local "Blues," which are all to be taken on the same ground, the most plentiful was *Agriades bellargus*, usually the rarest, the others, *Cupido minimus*, *Agriades corydon*, *Aricia medon* (*astrarche*),

Polyommatus icarus, much below the average. In south Devon *Pararge egeria* and *Pararge megera* were plentiful, particularly the latter, whilst *Pyrameis atalanta*, *Pyrameis cardui*, *Aglais urticae* and the "Whites" were comparatively scarce. At sugar in South Hants all Noctuidæ were very scarce, in South Devon *Caradrina ambigua*, *Agrotis saucia*, *Agrotis suffusa*, *Noctua c-nigrum*, *Noctua rubi*, etc., were plentiful, whilst *Aporophyla nigra*, *Aporophyla lutulenta*, *Epunda lichenia*, *Polia floricincta* were scarcely seen. In both counties, on the whole, Geometridæ were well up to the average, both as imagines and as larvæ. What were the causes of these somewhat remarkable discrepancies? Larvæ were not unusually scarce in the autumn of 1918 and the weather of last winter might be regarded as favourable to hibernating larvæ and pupæ. In my experience the percentage of imagines reared from wild dug pupæ differs very much in different years. Does not this point to some fatal influences apart from those prevailing whilst they are pupæ having affected the insect, say, whilst in the larval stage? On the whole, the results show that insects produced from hibernating larvæ were more numerous than those produced from hibernating pupæ. This result was not due to an over-wet season. Was it due to an over-dry one or to the ground being so hard at the time of emergence that a great many insects were unable to make their way out?

This is borne out, to some extent, by the greater scarcity of Noctuidæ as compared with Geometridæ, which, as a rule, pupate at no great depth in the soil. In our local woods *Hybernia defoliaria* was scarcely seen this season. On the other hand, *Apocheima hispidaria*, which also pupates at some depth, was remarkably abundant in the same woods. The ravages of *Tortrix viridana* might explain the local scarcity of certain oak-feeders. This cause can be greatly exaggerated, as I found larvæ swarming on the bushes below *Viridana*-infested trees and feeding heartily on hazel, etc.—*Trichiura crataegi*, for example. From this we may assume, incidentally, that larvæ are much more general feeders than we suppose.

An unusual preponderance of ichneumon might also account for a large number of larvæ. In certain years the proportion of stung larvæ is certainly much greater than in others. Are wild larvæ ever subject to parasitical plagues? I have found it difficult to account, otherwise, for the failure in certain seasons of large numbers of wild larvæ, notably those of *Boarmia abietaria*, *Macrothylacia rubi* and *Hylophila bicolorana*.

To say that unusual seasons have unusual results entomologically savours somewhat of an axiom. As a rule, we regard an unusually hot or dry summer as a favourable one entomologically. Last year we had an unusually dry winter followed by a more than average dry summer. The entomological result was not encouraging. It would be interesting

to have a tabular statement of the meteorological and entomological inter-dependence extending, say, over the last twenty years.

I now append a brief record of the season's captures as exemplifying the experiences detailed above.

In January I took a fair number of pupæ of *Smerinthus tiliæ* from under local elms. These gave me some very nice varied forms.

In February larvæ of *Sesia culiciformis* and *Sesia asiliformis* were found wherever timber had been lately cut. At the end of the month *Apocheima hispidaria*, *Polyptychus flavicornis*, *Hibernia leucophæaria* and *Phigalia pedaria* began to appear, the last two being unusually scarce.

On March 1st *Apocheima hispidaria* was out in remarkable abundance; five, six and seven were frequently found on a single trunk, the record giving 13 males and 7 females for the same oak trunk. They varied in a remarkable degree, both in size and markings, and included some nice melanistic forms. On the 16th a few larvæ of *Sesia andreniformis* were found, and a few also of *Arctia villica* basking in the sun. *Brephos parthenias* was scarce and did not appear until the second week in April. April 7th-14th was spent in the New Forest and produced *Panolis piniperda* (scarce), *Tæniocampa gracilis*, *Lobophora carpinata*, *Eupithecia abbreviata*, *Pachnobia rubricosa*, *Tæniocampa miniosa*, *Anticlea nigrofasciaria*, *Boarmia cinctaria*, *Pachycnemia hippocastanaria*, *T. munda*, *T. cruda*, *T. stabilis*, a few hibernated *Cidaria siterata* and *Vanessa polychloros*; also the larvæ of *Elloptia prosapiaria* (scarce), *Boarmia roboraria*, *Hylophila bicolorana*, *Geometra papilionaria*, *Cleora lichenaria*, *Cleora jubata*, *Thera variata* and *Nola strigula*. On April 20th, *Parasemia plantaginis* larvæ were plentiful in the sun. On May 17th I took larvæ of *Lithosia deplana*, *Boarmia abietaria*, *Laspeyria flexula*, *Eupithecia sobrinata*, *Scotodia rhamnata* and *S. retulata*.

On May 18th a visit to our local sand-hills showed the first emergence of *Mesotype virgata*. On the 19th a newly emerged female of *Stauropus fagi* was taken from an oak sapling. On May 25th the following imagines were taken: *Leucophasia sinapis*, *Perizoma affinitata*, *P. alchemillata*, *P. decolorata*. The first week in June produced *Bapta bimaculata*, *Epione advenaria*, *Drepana falcula* and *Hemaris tityus*. Sugaring gave *Agrotis cinerea*, *Grammesia trigrammica*, *Hama sordida*, *Mamestra genistæ*, *Mamestra contigua*, and larvæ-beating produced *Calymnia affinis* and *Plastenis retusa*.

June 6th-10th was spent in the New Forest, where sugar produced some beautiful extreme forms of *Grammesia trigrammica*, also *Mamestra contigua*, *Eurois prasina*, *Mamestra genistæ* and *Lobophora sexalisata*. The following were also obtained at the same time: *Acidalia subsericeata*, *Eulype hastata*, *Scodionia*

fagaria, *Macrothylacia rubi* and *Zygæna trifolii*, with *Brenthis selene* and *B. enphrosyne* much below the average numbers.

On the 14th larvae of *Zephyrus betulae* and *Anticlea nigrofasciaria* were taken full fed and some very fine vars. of *Zygæna trifolii*, including orange-tinted forms. Small larvae of *Hemaris fuciformis* were found on the 15th, but the special object of that day, *Lithosia rubricollis*, did not put in an appearance then or later.

On June 21st-22nd the only attempts at sugaring on the local sand-hills proved a failure, only a few *Mamestra albicolon* being taken, *Agrotis ripe* and *Leucania littoralis* being practically absent. The last week in June I saw *Argynnis cydippe*, *Dryas paphia*, *Bournia roboraria* well out and in numbers above the average. *Acronycta leporina* and *Noctua ditrapezium* were the only *notabilia* at sugar, which failed in its main purpose—the tempting of *Diptera orion*. Some fine vars. of *Lithosia deplana* were hatched out in the same week. The first week in July gave *Leucania faricolor* and *Acidalia remutaria* at sugar. In the New Forest *Dryas paphia*, with its var. *valezina*, and *Limenitis sibylla* were out in fair numbers, with some very nice varieties of all three. *Argynnis cydippe* was fairly plentiful and a beautiful *Lanceolata* was taken.

July 17th-23rd gave, at sugar, *Hama abjecta*, and at light *Petilampa areuosa* and *Euchloris pustulata*. The season's additions to the local list were *Enestis quadra*, *Noctua ditrapezium*, *Euchloris pustulata*, *Acidalia inornata*, *Eupithecia albipunctata*, *Pygaera pigra*, *Leucania turca* and *Nola albulalis*.

From August 2nd to September 12th was spent in south Devon with Mr. Woodforde. In the first week a few *Lithosia caniola* were taken at light. The insect is very fickle in its appearance, requiring very particular conditions of wind and temperature before it takes to wing. Mr. Woodforde had the best night among them on August 1st, when he also took *Eupithecia innotata* and *Perizoma tenuata*. In the second week of August a day was devoted to *Callimorpha hera*. Of these about a score were taken, including the orange and yellow forms. *Pararge megaura* was beginning to be very plentiful; *Bryophila glandifera* and *Bryophila perla* were and remained scarce. During most of August imagines of *Acronycta rumicis*, *Polia chi*, *Cnophos obscurata*, *Acidalia promutata* were to be taken from the rocks by day. Pupae of *Nonagria typhae* and *Nonagria geminipuncta* were locally plentiful. At Torcross small larvae of *Cucullia absinthii* were found, and pupae of *Nonagria geminipuncta*. A few larvae of *Anticlea cuncillata* were beaten along with a few of *Macroglossa stellatarum*. Larvae of *Phyrrea umbra* were fairly plentiful but badly stung; three larvae of *Heliothis peltigera* were also taken. A few *Colias edusa* were taken in the last week of August, including one *helice*, captured by finger and thumb whilst clinging to a flower-head in a gale of wind.

Larvæ of *Eupithecia* were found plentifully on Golden Rod, Valerian and Angelica.

Sugaring, on the whole, was disappointing. The best things taken were two *Leucania vitellina* on my own sugar and two on that of Mr. Milman. *Leucania putrescens*, *Calymnia affinis*, *C. diffinis* were scarce, *Caradrina ambigua* plentiful, *Agrotis sancia* and *Agrotis susfusa* in abundance. The only capture of note on my return was that of three larvæ of *Cucullia lychnitis* on September 15th. Locally autumn larvæ were practically non-existent, pupæ remarkably scarce, and the same might be said of imagines at ivy-bloom or on tree-trunks. After I left South Devon Mr. Woodforde stayed till October 23rd, and now tells me that, though ivy was abundant and the bloom profuse, hardly anything visited it except *Phlogophora meticulosa* and *Amathes pistacina*, both of which were abundant. Under half a dozen each of *Epunda nigra*, *Epunda lichenæ* and *Polia floricineta*, 2 *Lithophane socia*, 1 *Amathes lota*, 1 *Amathes circellaris*, 2 *Miselia oxyacantheæ*, 2 *Orrhodia vacciniæ*, 1 *Noctua glareosa* and 3 *Cidaria truncata* were his bag, although he visited many large clumps of ivy on every possible night. No insects were to be seen flying at dusk.

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A FEW NOTES FROM NORFOLK AND ELSEWHERE.

By G. H. GURNEY, F.Z.S., F.E.S.

ALTHOUGH demobilized from the Army last April, I have not been able to do a very great deal of collecting during the past summer, but the following notes on the few days I had may be of interest. On May 24th *Papilio machaon* was well out in the Broad district; some fifteen were seen on one favourite bit of marshland. This is a very early date for them, but the 24th was an exceptionally warm, mild day. On the 26th, which was sunny, but with a cold east wind, I only saw four in the same locality. On the 28th of the same month I made an expedition to some woods near Peterborough, mainly with a view to seeing *Carterocephalus palæmon*; this I found to be very plentiful, and generally quite fresh. *Nisoniades tages* and *Hesperia malvæ* were also common in the same locality. *Brenthis euphrosyne*, *Callophrys rubi*, *Pararge egerides*, *Gonepteryx rhamni*, *Nemeobius lucina*, common and fresh, *Cœnonymphæ pamphilus* and a single *P. megæra* were all noted, and a rather melancholy feature of the landscape were the acres of brown oak trees, completely denuded of their leaves by the depredations of the larvæ of *Tortrix viridana*, etc.

Returning home, an interesting discovery was made in the shape of some dozen larva of *Thecla w-album*, which were beaten from the lower boughs of a very large wych elm which grows in the park quite close to the garden. It is a somewhat remarkable fact that I should never have noticed *w-album* on this tree before. Having passed constantly close to it for the past thirty summers one would have thought that if the imagines were flying round the tree in June or July, one would have been bound to notice them; moreover, on previous occasions I have repeatedly beaten the tree in the spring for *Noctuæ* larvæ, and have never before, as far as I know, had *w-album* larvæ fall into the beating-tray. It is a very large, isolated tree, a most unlikely and unsuitable locality for the species, which I have never before seen in this district at all, where wych elms are scarce—in fact, *w-album* is a rare butterfly in Norfolk, though possibly overlooked. However, it only shows one may live close to a certain thing without being aware of its proximity, as I cannot believe these larvæ were stray individuals hatched from ova laid the previous summer by some wandering female. Unluckily I was away from home during the first weeks of July, and so was unable to note whether the butterflies were haunting the tree then. My larvæ all emerged successfully into fine specimens. Larvæ of *Zephyrus quercus* were very abundant locally during June. On July 11th, on Felthorpe Heath, some eight miles from Norwich, *Plebeius aegon* was very plentiful, males abundant, females just emerging. I was glad to see *Argynnis cydippe* also quite common in restricted areas: this is an insect which has become much more plentiful in Norfolk during the last six or seven years; previous to that it had almost died out in many localities in the district. *Dryas paphia*, on the contrary, has become practically extinct in several spots in North Norfolk where it was formerly found. I can give no explanation for this. Some of its most favoured haunts were on private property, where it was never collected and where the ground remains in apparently exactly the same condition as it always has been. Other insects noted on the 11th were plenty of fresh *Epinephile jurtina*, a few *C. pamphilus* and a single fresh *Augiaades sylvanus*.

From July 18th I spent a few days at Lyndhurst. The weather was very bad all the time, and I did not do much. During the few sunny periods *D. paphia* appeared in great profusion with var. *valezina*, and the usual swarms of *Limenitis stibylla*, mostly rather worn. I met two entomologists, who showed me beautiful varieties of this species they had taken, and, though I did not meet with any myself, a large number were captured this year in the Forest.

Eugonia polychloros was not out at this date; neither did I see any sign of *Apatura iris*. With regard to the latter species in Norfolk, it is melancholy to record that its last known locality

in the county is now no more. Till three years ago *A. iris* managed to maintain itself in Foxley Wood in West Norfolk, but in 1915 the whole wood was sold to the Government, and the greater part of the trees were immediately cut down, and one more of our most interesting entomological localities, where several very local species just managed to exist, was ruthlessly swept away. Other insects noted in the New Forest in the various enclosures were *Apantopus hyperanthus* and *E. jurtina* everywhere, the former quite fresh, a few *Epinephile tithonus* and some beautifully fresh *A. cydippe*; fresh *Celastrina argiolus* were seen two or three times, and odd specimens of *A. sylvanus*, *A. flava*, *Pieris napi* and *P. rapæ*.

On July 22nd I was back again in Norfolk, and spent a few hours on the 30th at Felthorpe. Here I saw much the same insects I had noted on July 11th. *P. ægon*, still quite fresh, with a fine show of females now. Large patches of *Gentiana pneumonanthe* in full flower were a beautiful sight, as also the great abundance of the Common Meadow Orchis.

Ten days later I found *A. hyperanthus* quite common, though naturally worn at this date, in a small wood near here where I had never noticed it before, and a very few specimens actually appeared in this garden. A rough field was full of butterflies—*A. hyperanthus*, *E. jurtina*, *Polyommatus icarus*, *P. megæra*, *E. tithonus*, *A. flava*, *Vanessa io*, *Aglais urticæ*, and the three common Pierids. With regard to *P. megæra*, this is a butterfly which has become commoner in this district during the past five or six years. Fifteen years ago it was abundant in our sandy lanes and in all suitable places, but it practically disappeared, and, anyhow round about here, became quite a rare insect; now it is getting up its numbers again, and this year was common everywhere. *E. tithonus* is always a very common butterfly here, the females large and richly coloured, the males small and dark. On August 12th I visited some very good ground twelve miles west of Norwich. In a large clearing in the middle of a private wood I found *Hipparchia semele* in the very greatest profusion. The trees had been cut down, and grass and heather had sprung up with bright patches of *Lotus corniculatus*. I don't think I had ever seen this species in such extraordinary numbers anywhere; four or five would dart up at one's feet, or rise fighting from the ground, or several males would wildly pursue a female until they got lost in the wood amongst the trees which had not been felled. Some fine fresh *C. phœbe* shared the lotus plants with *P. icarus* and an occasional *C. pamphilus*, while some *P. ægon* fluttered over the heather. Proceeding to a marshy common a mile further on, the most interesting insects noted were three or four specimens of *Zygæna trifolii*, which were confined to one small corner of the bog; many fresh female *P. napi* were busy ovipositing on various Conifers, and a few worn *A. cydippe*

sunned themselves on the bramble flowers. Many bog-loving plants grow here—Butterwort, the Long-leaved Sundew, Bladderwort, Housewort, Pettywhin, Cotton Grass, Spotted and Marsh Orchis, Bogbean, Meadow Thistle, and the lovely Grass of Parnassus.

On August 17th I visited a locality in North-West Norfolk for *Agriades corydon*. The special locality for this species in this district is a long, winding, narrow valley, the steeply rising sides covered with short turf; along the top woods of beech and oak stretch for a considerable distance. On the south side (only) of this valley, covering a strip of ground perhaps a mile long, *A. corydon* was very abundant; both sexes were in good condition, but amongst a very large number examined no sign of any variation was observed. Rather further along a small colony of *Aricia astrachanic* was noted, but *Angiades comma*, which I had hoped to have seen, failed to put in an appearance.

During the last days of the month we had our usual visitation of Vanessids in the garden, though all of them were scarcer than usual. *Pyrameis atlanta* was perhaps the commonest, but both *V. io* and *A. urticae* were only represented by some half-a-dozen examples of each species. A large fresh brood of *P. brassicae* flooded the garden about now too. Some of the females were very big and fine.

This practically ended my collecting for the summer, as I very soon left Norfolk for the north of Scotland.

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BUTTERFLIES IN MACEDONIA.

BY HERBERT MAE.

ALTHOUGH the non-entomological officers and men who spent two or three years in the Balkans were greatly impressed by the beauty of the numerous butterflies seen there throughout the summer, my own feeling, as a lifelong collector of butterflies, was one of considerable disappointment with the number of species. As a matter of fact five species which abounded in individuals were entirely responsible for the display which attracted the lay attention to them. These were *Pyrameis cardui*, *Colias edusa*, *Pontia daplidice*, *Papilio machaon* and *I. podalirius*. All these species, so strikingly beautiful, were so numerous all through the fine season that it was easy enough to get the impression that Macedonia is a butterfly land.

Had I been a collector of butterflies doing a little military duty instead of a soldier doing a little butterfly hunting it is probable I should have had a larger list of species in my note-

book, for I never visited a district where it would be so easy to overlook a species which is local in its habits, and most butterflies, as every experienced collector knows, are local to a surprising degree.

On the surface Macedonia appears to be a wide, half-desolate plain broken up by rough hills, but a closer acquaintance reveals the fact that the country is scored and seamed with innumerable ravines, sometimes wide and shallow, at others deep and confined, and in each of these ravines one finds certain species of plants and animals which often are not found in the others. Where a ravine contains a stream which is perennial, the vegetation and animal life is very diverse and affords a rich harvest to the naturalist, but most of them are dry and barren as the plains during the later part of summer.

My more or less restricted rambles were confined to the district between Sariguel on the south, Lake Ardjan on the west, Lake Doiran on the north and the Galiko River on the east, the only exceptions being a month in the winter spent at Karasuli on the Vardar and a few weeks in the passes north of Doiran after the advance. In May and June, 1917, I was exceptionally well favoured with time and opportunity for studying the local fauna, and I look on those weeks spent in the innumerable and tortuous ravines which debouch into the Galiko River as a feast of nature study such as comes to the average individual but rarely. Looking back on the extraordinary richness of the field, I wonder sometimes whether I made the most of my opportunities. The very richness made it difficult to keep in touch with any one species, each day revealing new and interesting forms to attract the attention. In particular I had very little opportunity of searching for larvæ, and only a few of the more obvious species came to my notice. It was impossible to do any night work, and even when a few larvæ were discovered it was difficult to keep them alive for lack of suitable receptacles, and a sad fate often befell some cherished broods when a sudden move meant the abandonment of all but essential kit.

Macedonia being at the diametrically opposite end of Europe a comparison between the species of the two countries is bound to have some interest, and while the records of a single observer over only two seasons are insufficient to enable an exhaustive comparison to be made so far as the common species are concerned, it is fairly reliable.

Of a combined total of eighty-three species, twenty-eight are common to both countries. Of thirty-six species which are common in Britain only fourteen are abundant in Macedonia, and of thirty-four which I found common in Macedonia twenty-one are absent or very rare in Britain.

In the *Pieridæ* there is the closest agreement in species, for of the five common British ones I found only one absent in

Macedonia, while of eight species which were very common in Macedonia four are rare and one absent from Britain.

British preponderance in *Nymphalidae* is largely accounted for by the scarcity of the common stinging-nettle, as the absence of *A. urticae* proves, while in the genus *Argynnis*—notoriously local insects—there appears to be a total difference in the species of those I found in Macedonia, not one being known (except *lathonia* very rarely) in Britain.

In the *Satyridae* again there is a great disparity, as out of eleven British species I only found three in Macedonia, while three species found there are not known in Britain.

The *Lycaenidae* are such local insects that it is not feasible to draw a comparison, though I found all the universally distributed species common enough in Macedonia. In the *Hesperiidae* there is wide disparity, only two species being common in both countries, the most abundant in each being absent in the other.

With regard to varieties, four of our British species appear to differ markedly in Macedonia, these being *P. megaeira*, *C. pamphilus*, *C. phleas*, *A. medon* (*astrarche*) and *A. flava* (*thaumas*).

Another feature I noticed was the occurrence of extremely dwarf forms of several species, similar to those produced among bred specimens from time to time, which is, I believe, generally attributed to malnutrition of the larvae by unsuitable or inadequate food, and it is possibly the case that in such a dry climate a certain number of larvae may be obliged to subsist on food of less succulence than ordinary.

Iphiclus podalirius.—Although never what one would call abundant, this fine butterfly was generally distributed, and I could usually count on seeing one or more individuals in certain suitable places. Unlike *machaon*, which often haunted the driest hillsides, it was seldom found far from water, and was usually confined to wooded ravines where the stream never dried entirely. Its flight is decidedly more lofty and sailing than that of *machaon* and it is more difficult to capture. One day I was sitting among the ruins of a house overgrown with weeds watching a pair of these insects sailing round and I happened to toss away a little ball of paper. One of the butterflies immediately swooped down after it. I repeated the action, not only then but on several subsequent occasions, and almost invariably *padalirius* would dash after the falling object.

I several times saw the females depositing on pear trees, but too high up to enable me to secure the ova. My specimens conform fairly closely to type, except one, which has the pale line that breaks the basal stripe exceptionally wide and the inner margin of the hind wings is not dusted with black.

(To be continued.)

NOTES AND OBSERVATIONS.

CROCALLIS ELINGUARIA F. SIGNATIPENNIS.—Before seeing Mr. Porritt's note (*antea*, p. 258) and Mr. Smart's note (*antea*, p. 278) I should have said that this form was decidedly scarce. During about twenty-five years' collecting in Lancashire and Yorkshire I have not met with this form, neither has it been brought to the meetings of the Lancashire and Cheshire Entomological Society until Mr. Smith showed us his example. My own series of *C. elinguaria* comprises specimens from Leeds, Huddersfield, S. Lancashire, Delamere and Penmaenmawr; it has been selected from large numbers bred from wild larvæ at different times, yet nothing like *signatipennis* has occurred to me. The notes alluded to above indicate that in the Huddersfield district the newly-named form may exist as a local race, and it would be interesting if the resident collectors could give us some definite idea as to the relative proportions that *signatipennis* bears to the form with normal shaped band. Mosley's fig. 5, pl. i, shows a more extreme form than Mr. Smith's (vol. lii, p. 226, fig. 2), in that the lines are joined considerably before they reach the inner margin, and in Barrett's fig. 1g, pl. 293, they approach but do not meet, whereas in the type of *signatipennis* they just coalesce and the band terminates in a point.—WM. MANSBRIDGE; Dunraven, Church Road, Wavertree, Liverpool.

VARIATION IN THE PLUSIDÆ.—Mr. C. G. Clutterbuck is to be congratulated in discovering such a beautiful and extreme variety of *Plusia pulchrina*. The form mentioned by the late Mr. Barrett as from Omagh, Co. Tyrone, with a large orange spot in the middle of the fore wings, no doubt refers to a variety not infrequent locally, with an orange-coloured, wedge-shaped blotch, just below the Y mark, and in extreme specimens extending to the inner margin. It may be of interest to note here a rare variation in the allied *P. festucæ*, in which the two metallic blotches are joined together, forming a wedge-shaped mark across centre of fore wings. The name *juncta* may well indicate this form.—THOMAS GREER; Carglasson, Stewartstown, Co. Tyrone.

ABNORMAL SPECIMENS OF ABRAXAS GROSSULARIATA.—A rather curious specimen of *Abraxas grossulariata* emerged from a pupa I had last summer. I was careless enough to let the pupa get very wet while I was keeping it, and I had no expectation at all that the imago would emerge. However, it did, and the abdomen of the moth was very wrinkled and colourless, as one might expect. The wings were, however, quite perfect, and the left wings and the hind right wing were all reasonably normal in marking. The right fore wing, however, had the black spots on the inside of the yellow band merged together in a very peculiar manner as though the colours had run. The effect is an irregular-looking smear in the centre of the wing. Could such an occurrence be the result of the damp, or is it a natural variety of this extremely variable species?—ARTHUR SOPWITH; Chasetown, nr. Walsall.

BOMBUS AND VESPA SPECIES IN THE RANNOCH DISTRICT.—I was interested during my stay at Rannoch in investigating the species of

these genera which occurred. Of the former, *Bombus lucorum*, *B. latereillellus*, *B. jonillus* and *B. lapponicus* were the only species seen. One female of *Psythyrus quadricolor* was taken. *B. lapponicus* was disappointingly rare, only one female being seen during the whole of my stay. *Vespa rufa* and its supposed parasite *V. austraica* were not uncommon in the Black Wood and around the farm at which I stayed. Several examples of the latter could be noted each day without any searching: they were all females.—W. G. SHELDON.

'SEITZ' MACROLEPIDOPTERA OF THE WORLD.' VOL. IV: "PALÆ-ARCTIC GEOMETRIDÆ."—We understand that the English and French editions of this volume are now complete and can be had of the publishers.

SCARCITY OF *AGLAIS URTICÆ*.—Referring to Mr. Rowland Brown's note under this heading ('Entom.', lii, p. 277). I made a special attempt to obtain larvae of this butterfly at the end of July and the beginning of August in the hope of obtaining some aberrations and visited many places in Surrey and Sussex, but met with very little success. On August 3rd last, at Worthing, I took two webs containing in all about sixty larvae which were then little more than a quarter of an inch in length. The larvae were exceedingly voracious and fed up with great rapidity, having all gone up to the top of the breeding-cage within eight days, and eventually I had fifty-four pupæ. Towards the end of the month, finding no emergence, I carefully examined the pupæ, and was very surprised in view of the size of the larvae when taken and disgusted to find that the cage was alive with very small "Ichneumons" which were still emerging from holes in the sides of the pupæ, with the result that not a single butterfly emerged and four only of the pupæ had not been holed. During the autumn I took one specimen of this butterfly only, and that was in my garden here. During the season (1919) I had more larvae and pupæ in my breeding-cages than usual and the percentage of "ichneumoned" larvae and pupæ has been very much higher. Out of twenty-one larvae of *Abraxas grossulariata* only three had escaped parasitic attention. I should be interested to hear if other collectors have noticed an increase of parasites this season, and if so this may to a certain extent account for the scarcity of such a usually common butterfly as *A. urticæ*.—A. M. LONGHURST; "Artro," St. James's Avenue, Hampton Hill, Middlesex.

COLIAS EDUSA IN BRITAIN, 1919.—As *Colias edusa* has been reported from only a few localities in 1919, and none between Leicester and Aberdeen, the following observations by reliable friends may be worth recording. (1) *Westmorland*.—One *C. edusa* seen about three miles south of Kendal, on September 6th, by Mr. Arthur Thoms. (2) *Isle-of-Man*.—One *C. edusa* seen on Bradda Head, September 15th, by Mr. John Booth. In both cases a near and clear view of the insect was obtained. Mr. Mansbridge informs me that he has heard of no record for Lancashire or Cheshire this year, but I may mention a capture at Hest Bank, near Lancaster, by Mr. Mawson. Evidently there has been a greater number of *C. edusa* this year in Britain than records up to the present indicate.—J. D. WARD, Limehurst, Grange-over-Sands.

SOME NOTES ON THE SEASON 1919.—The last season has in my experience been on the whole unsatisfactory. Some species, especially among butterflies, appeared in abundance, while others seemed to be entirely absent. In the spring I was struck by the great profusion of *Pieris napi*, while the allied species *P. rapæ* was scarcely seen. I wondered whether that would be repeated in the summer brood. Here, however, I found that while the first small "Whites" to appear were *P. napi*, their place was soon taken by *P. rapæ*, and after that I did not see another specimen of the former species. *Celastrina argiolus*, which usually occurs plentifully in my own garden, was very scarce in the spring, while only an occasional specimen was seen of the second brood. In July in the New Forest all butterflies were exceedingly abundant. I don't think I have ever seen more *Dryas paphia*, *Argynnис cydippe* or *Limenitis sibylla*. The var. *valezina* of *D. paphia* occurred freely. I saw two very fine varieties of the ordinary form, one a magnificent suffused specimen, just taken by other collectors, while a large number of black forms of *L. sibylla* were also taken. All the other July species of butterflies were equally abundant. A little later in the month I was in Lincolnshire, where the only butterfly that occurred in any numbers was *Aphantopus hyperanthus*. In a particular wood I worked there was a great tendency towards reduction in the size of the wing-spots. I took no less than six specimens of var. *arete*. In the New Forest, though I examined large numbers, there was no tendency to variation. I found that earlier in the season *Cyclopides palaeon* had occurred in profusion. So far as my experience went the autumn butterflies failed to put in an appearance. Though at the beginning of August in Lincolnshire *Aglaïs urticae* appeared fairly freely, I did not see a single specimen after my return home, thereby bearing out the experience of Mr. Rowland-Brown, as recorded in the December 'Entomologist.' It was the same with *Pyrameis atlanta* and *Vanessa io*. In this locality they were entirely absent. Another common butterfly which I did not come across till October was *Chrysophanus phœas*, though I had been specially on the look-out for it. I wonder whether my experience of the scarcity of some of our common butterflies has been that of others. With regard to night work the results were most disappointing. While most day-flying moths were in their usual numbers, sugar absolutely failed to attract *Noctuæ*. On the downs here a few common species were taken early in the summer, but in the New Forest night after night in July did not produce a single moth, nor were *Noctuæ* found by any other means. A little later, in Lincolnshire, things improved slightly, but some nights there was scarcely a moth to be seen. The best things in a fortnight's sugaring were one *Apamea connexa* and two *Cosmia paleacea*. I had another turn at sugar in September, in the New Forest, when I hoped the tide of failure would have turned. But no! the situation was the same—only one *Amphipyra pyramidea* and one *Catocala sponsa*. September 16th was surely a very late date for this species. Considering the date it was in very fair condition. The only really good night I had at sugar, so far as numbers are concerned, was on the downs here at the end of August, but only common species were represented. But it was not only sugar that was so remunerative;

dusking paid very little better. Night after night I spent in the New Forest waiting in vain for something to turn up. It was very much the same here. It was not till I got to Lincolnshire, in the latter part of July, that things began to appear on the wing at dusk, but then not in any abundance, with the exception of *Acidalia bisetata*, which really swarmed. I had never previously seen this species in anything approaching the numbers which occurred. *Porthesia similis* also flew freely. I only went out once in the late autumn to look at the ivy, but though it appeared an ideal night not a single moth could be seen. Altogether the past season has been in the main distinctly disappointing.—J. E. TARRAT (Rev.); Fareham, Hants.

ADDITIONAL NOTES ON THE RHOPALOCERA OF THE PAS-DE-CALAIS AND THE SOMME.—As Mr. N. C. E. Miller surmised in his article in the July 'Entomologist,' his observations were of great interest to at least one other collector, whose duties for certain periods were in the same localities. Where his notes agree with mine I have not thought it worth while to record mine. With these exceptions the following is a list of my observations for 1917 and up to May, 1918: *Papilio machaon*: The first brood worn in June, the second brood common in August, 1917, at Albert. Some of the ♂s were very dark. *Colias hyale*: Very common, both yellow and white forms. *Colias edusa*: From July 3rd to September 24th, 1917, at Albert, never common. *Polygonia c-album*: One hibernated specimen, Avesnes-le-Comte, May 9th, 1917. *Eugonia polychloros*: St. Pol, 1917; Abbeville, 1918. *Euranessa antiopa*: One specimen, Albert, August 14th, 1917. *Arischnia levana*: Locally common, Flixecourt, 1918; ab. *porsa*, Albert, 1917. *Argynnis lathonia*: One example, Albert, August 10th, 1917. *Brenthis euphrosyne*: Flixecourt, 1918. *Melitaea cinxia*: Locally common, Flixecourt, 1918; *M. aurinia*: Locally common, Flixecourt, 1918. *Aphantopus hyperanthus*: Albert, 1917. *Zephyrus betulae*: One freshly emerged ♀ in a garden in Albert, July 31st, 1917. *Zephyrus quercus*: One larva, Avesnes-le-Comte, May, 1917, emerged June, 1917. *Cyaniris argiolus*: St. Pol, 1917; Abbeville, 1918. *Thanaos tages*: Avesnes-le Comte, 1917; Abbeville, 1918. *Adopaea thaumas*: Albert, 1917. To recapitulate Mr. Miller noted the following six species which I did not see: *A. iris*, *L. sibylla*, *D. paphia*, *A. aglaia*, *C. arcania* and *C. rubi*. My list adds the following ten species: *C. edusa*, *E. antiopa*, *A. lathonia*, *E. euphrosyne*, *M. aurinia*, *Z. betulae* and *quercus*, *C. argiolus*, *T. tages* and *A. thaumas*. *P. napi* were all over the Somme area in 1917 in countless myriads, rising in clouds from mud-patches. *C. hyale* and *P. cardui* were abundant, and there appeared to be a succession of emergences. On June 28th, 1917, I saw a small dark Fritillary like *Argynnis dia* near Albert, but I could not identify it. I searched in vain for *L. sinapis*, *A. selene*, *C. rubi*, *L. corydon* and *bellargus* in what appeared to be suitable localities near Avesnes-le-Comte and Albert.—F. W. J. JACKSON; Woodcote End House, Epsom.

CORRECTION.—On p. 1, line 26, for "Mr. E. W. Lipton" read "Mr. E. W. Lifton."

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 9th, 1919.—Mr. Stanley Edwards, F.L.S., President, in the Chair.—Mr. J. R. Leeson, M.D., J.P., F.L.S., of Twickenham, was elected a member.—Mr. Curwen exhibited Zygænidæ from South Italy, *Z. rubicundus*, *Z. erythrus*, *Z. stœchadis* and ab. *dubia*, and *Z. oxytropis*; aberrations of *Z. filipendulae* from Deal; and *Z. trifolii* ab. *minoides* from Swinley Woods.—Mr. Moore, *Monohamus tililata* (Col.) from Rotherhithe.—Mr. Barnett, series of the two broods of female *Polyommatus icarus*, Surrey.—Mr. Hy. J. Turner, *Dione vanillæ* var. *maculosa*, *Calthodes ethlius* and *Basilona imperialis*, all from Cordoba, Argentina.

October 23rd, 1919.—The President in the Chair.—Exhibition of and discussion on the “Variation in *Aglais urticæ*.” The President introduced the subject by referring to the establishment of the genus *Aglais* by Dolman in 1816. Mr. Hy. J. Turner read a series of notes dealing with (1) the features available for variation, (2) the lines of actual variation, (3) the various named forms which fall into these groups, (4) less frequently occurring forms, (5) extremely rare aberrations, (6) a reference list of the named forms, and (7) short diagnoses of these forms.—Mr. Sperring read a series of notes dealing with (1) racial series from S.E. London, Essex, Cambridge, Lincoln, Tyrone, Inverness, Kincardine, Paisley and Arran, (2) aberrational and racial variation, (3) characteristics of various named forms which he exhibited, and (4) colour aberration caused by applied chemical action. Messrs. A. W. Mera, B. S. Curwen, A. E. Tonge, C. H. Williams, T. L. Barnett, C. Nicholson, R. Adkin, H. B. Williams, W. J. Kaye, J. Riches and E. J. Bunnet took part in the discussion and exhibited series or special forms.—Mr. Curwen exhibited *Sirex gigas* from Twickenham.—Mr. B. S. Williams, a series of *Charæas graminis* with variable ground-colour and a specimen with coalesced marking.—Mr. Tonge, a series of *Oporabia autumnaria* from Preston and Langridge Fell, including a strongly melanic form.—Mr. Frohawk, a small living larva of *Nonagria typhæ*, already fourteen months old; a series of *Limenitis sibylla*, showing gradation from type form to ab. *nigrina*; *Dryas paphia* with somewhat radiated hind wings and others showing coalescence and suffusion of spots; and *Argynnis cydippe*, a series showing gradation in extension of the spotting, and one with only three spots in the row on the hind wing.—Hy. J. TURNER, Hon. Editor of *Proceedings*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—October 20th, 1919 (at the Royal Institution, Colquitt Street, Liverpool).—Mr. R. Wilding, President, in the Chair.—Exhibits were numerous and varied as is usual at the opening meeting of the session.—Mr. R. Wilding had a large number of Lepidoptera from Cartmel, including a long series of *Argynnis aglaja* and *Brenthis selene*; among the latter was a very fine underside variety. He also showed *Plusia festucæ* from the same locality.—Mr. W. A. Tyerman exhibited, on behalf of Mr. H. M. Hallett of Penarth, a varied series of *Bryophila muralis*

from Cardiff, also *Polia fluvicincta*, and contributed notes.—Mr. S. P. Doudney showed a series of *Erebia ethiops* with a xanthic aberration, *Argynnis cydippe*, very strongly marked underside, *Zephyrus quercus* and *Anuitis plugiata* from Arnside; *Plebeius agen*, var. *masseyii*, *Hydrelia unca*, *Carsia paludata* from Holker; *Epinephile jurtina*, xanthic aberration, *Agriades corydon*, *Bryophila muralis* and *Gnophos obscurata* from Folkestone.—Mr. R. Tait brought *Celastrina argiolus* from Penmaenmawr and reported the presence of larvae of *Plusia moneta* in the same locality; *Thecla pruni* and *Aplecta adrena* from Monks Wood: he remarked on the great scarcity of Lepidoptera in South Devon and at Wicken in July.—Mr. J. W. Griffin: *Tephrosia biundularia*, *Ellopia prosapiaria*, *Eupithecia coronata*, *Aplecta nebulosa* and *Bryophos parthenias* from Delamere; *Notodonta camelina*, *N. dromedarius*, *N. ziczac*, *Hylophila prasinana* and *Euclidia ni* from Simonswood; *Trochilium crabroniformis* and *Agrotis nigricans* from Wallasey.—Mr. S. Gordon Smith exhibited a large number of Lepidoptera, including the type-specimens of *Crocallis elinguaria* var. *signatipennis*, Newst. & Smith, *Nyssia zonaria* var. *ochracea*, N. & S., *Amphidasys strataria* var. *ochrearia*, N. & S., and *Tephrosia biundularia* var. *venosa*, N. & S. From Chester, chiefly taken at light, *Cnobia rufa*, *Cirrhedia xerampelina* and *Calania lntosa*: from Delamere, *Nonagria geminipuncta*, captured by Prof. Newstead and new to the Lancashire and Cheshire List. A series of *Callimorpha dominula* from Aberhosan, N. Wales. From Prestatyn a series of *Cosmotriche potatoria*, including two dark females and one male with three of the wings dark, the other, right fore wing, being yellow.—Mr. W. Mansbridge brought a long series of *Sarrothripus recayana* from the New Forest, which included vars. *variegata*, *adusta*, *afzeliana*, *fasciata*, *fusculina*, *melanosticta*, *ramosana*, and *stoninus*; *Plebeius agen* var. *masseyii* from Holker and Witherslack, *Hydrelia unca* from Holker, *Cidaria truncata* and *Zonosoma pendularia* var. *subroseata* from N. Staffs. A fine radiate aberration of *Chrysophanus phleas* from Ainsdale.—Mr. Prince had a very fine lot of *Agriades corydon*, including vars. *semisyngrapha*, *striata* and other forms.—WM. MANSBRIDGE, Hon. Sec.

RECENT LITERATURE.

A Compendium of Named Varieties of Abraxas grossulariata.

This most useful pamphlet, by the Rev. G. H. Raynor, M.A., contains a great deal of compressed knowledge, the result of twenty years' study by this well-known specialist. The fifty-five named forms are arranged in three groups under the headings of **GROSSULARIATA**, **LACTICOLOR** and **VARIEGATA**, and comprise respectively twenty-eight, twelve, and fifteen named aberrations. The work is exceedingly well done, and should prove of value to all who are interested in this protean species.

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THE LIFE-CYCLE OF *CACŒCIA UNIFASCIANA*, DUPONCHEL.

By W. G. SHELDON, F.Z.S., F.E.S.

SOMETHING is already known of the life-story of this common and widely distributed Tortrix, but what is known does not amount to much, and the supposed facts are not by any means all correct.

Barrett in 'Lepidoptera of the British Isles,' vol. x, p. 181, summarises what was known in 1905—the date on which the volume was published—thus :

" Larva apparently undescribed. It is stated—I think by every author who has written on the subject—to feed in the spring upon privet (*Ligustrum vulgare*), but no details seem to have been given, and I have searched closely on privet, where the moth occurs plentifully, without result. Yet I am assured that it feeds in the young shoots and spins up between the leaves.

" Pupa glossy blackish-brown; wing covers showing the lines of the nervures; segments smooth but swollen into smooth ridges or rounded hoops; cremaster rather long, beak-like, hooked behind. Between the leaves when the larva has fed; its cocoon made with very little silk."

One wonders at first glance where Barrett could have obtained such a detailed description of a pupa the larva of which he says was apparently undescribed; I cannot find any authority for it, and in its absence I can only suspect that he found a Tortrix pupa upon privet, and assumed—I do not know on what evidence—that it referred to the species I am discussing.

It does not agree with the actual pupa of *C. unifasciana*, and presumably therefore must refer to some other species.

Spuler, in the third edition of Hoffmann's 'Schmetterlinge Europas' in 1908, ii, p. 248, writes : " The larva is reddish-grey with black raised spots, the head yellowish, the prothoracic plate dark brown, divided by a thin longitudinal line; the anal plate is light brown; it lives in April and May on *Ligustrum*, partly on withered leaves."

So far as it goes this description appears to be correct, but both Barrett and Spuler entirely overlook—or ignore—the fact

that this species, in common with so many of the Tortrices, goes through the greater portion of its larval existence in the autumn.

A suburban garden does not at first sight seem a promising scene of action in which to work out the life-history of a species of which so little is known as is the case of *C. unifasciana*, but I have known for some years that mine contained a fairly numerous colony of this moth, and was therefore a favourable ground for the purpose. This colony seemed centred amongst the fruit trees of the kitchen garden, adjacent to which, however, were a number of forest trees, and not having looked up what was known of the larval habits, I at first assumed that the chosen pabulum was the leaves of one or another of my fruit trees, and females were netted and confined each year over sprays of all those growing near when the individuals of the colony flew, with an entirely negative result so far as the obtaining of ova was concerned. In the year 1918, however, I found the moths flying at dusk abundantly over a short privet hedge in one corner of the kitchen garden, and this year the females obtained were confined over sprays of this shrub.

The result was that ova were deposited freely, and the resultant larvae were reared without difficulty on its leaves.

In my first attempts to obtain ova I confined the females over apple, pear, plum, hornbeam, elm, oak, birch and *Clematis vitalba*. The successful attempt included, as well as privet, golden rod and loganberry, both of which grew near by. This was on July 28th, 1918. On August 1st, on examining the plants, I found six clusters of ova, all deposited upon privet leaves; these clusters each contained from six to twelve ova. They were all fixed to the upper side of the leaves on the midrib; each ovum in a cluster overlapped the others, or was overlapped, as is usual in this group.

The ovum is a very beautiful object; it is silver-grey in colour, not opalescent, but slightly glabrous. The surface consists of a large number of figures divided by fine raised margins, as is usual amongst the Tortricidæ, but the hind margins are bolder and the figures are more uniform in size and shape than any other *Tortrix* ovum with which I am acquainted. It is circular in outline, about .83 mm. in diameter, and is evidently very fluid when deposited, for there is a platform of the envelopes around the clusters. This platform is about .17 mm. in width. The ova themselves stand well up above the leaf to which they are affixed—about .2 mm. above it.

On August 4th the ova had a distinct nucleus, ochreous yellow in colour, circular in outline, and for size about half the extreme diameter of the ovum. Six days later the whole ovum was reddish-brown in colour.

On August 12th the larvae—or most of them—emerged. They were 1.65 mm. in length. The head and prothoracic plate was

light brown, very transparent and glabrous, sprinkled with dark brown dots; behind the prothorax the larva was in colour dull brownish-green, very transparent, the alimentary canal and contents of intestines showing plainly, especially in the mesothorax and metathorax. Within the twelfth segment a nodule of frass was noticeable as a dark olive-green patch.

In the first instar the larva fed between two privet leaves, making small round holes in the lower cuticle of the upper and the upper cuticle of the lower leaf, spinning a slight web and living therein. When ejected it was exceedingly active, crawling at a great rate over and off the leaf; so active in fact was it that it was impossible to keep it in the field of the microscope whilst the description was made, and I had to confine it in a glass cell during that process.

On August 25th the larva was in the second instar; the head was very pale brown, transparent and glabrous; there was a black spot on each side of the mouth. The prothorax was dark brown; the segments behind the prothorax were light brownish-green. The length then was 3·33 mm. It was still exceedingly active; it fed only on the lower cuticle of the leaf alongside the midrib, dwelling within a web; there was no attempt to roll or spin together the leaf.

On September 5th the larva had attained the third instar; it was then 4 mm. long, the head was very transparent and glabrous, very pale brown, darker round the mouth, and there was a dark spot on each side of it. The prothoracic plate was on the dorsum, of the same colour as the head, but at the sides dark brown, almost black, equally glabrous as the head. Behind the prothorax the segments were dull pale brownish-green, very transparent, the alimentary canal being visible. Within the anal segment a pellet of excrement showing plainly as a dark blotch. The tubercles were black and rather prominent.

By September 21st the larva had spun together a portion of a dried privet leaf and prepared for hibernation inside it. On October 6th my stock of larvæ were put out on growing privet enclosed in a muslin sleeve. On this day I found wild larvæ hibernating on privet in a web spun on a withered leaf which was still adhering to the stem on which it grew.

On April 5th, 1919, I took the larvæ out of the sleeve and started them feeding upon privet leaves in a cold room. On this day I searched for wild larvæ on the privet bushes but could not find any. Five days later my larvæ had commenced to feed upon young leaves, apparently only at night, sheltering during the day amongst the dead leaves amongst which they had hibernated. They had greatly increased in size, were about 10 mm. long and apparently almost full grown. The head was transparent and highly glabrous, light brown in colour; the prothorax was in front the same colour as the head, but with a darker collar at the rear;

it also was glabrous. The segments at the rear of the prothorax were dull brown in colour, still very transparent, the alimentary canal showing prominently; the spiracular area and ventral surface was much paler brown. The tubercles were not very prominent.

On May 15th the larva under observation had changed to a pupa. It had fed very slowly, without any change of instar, since hibernation, remaining in spun-together dead portions of a privet leaf during the day and feeding at night; it was when full grown 1·2 mm. long.

Pupa 8 mm. long, of average stoutness, when first changed light reddish-brown in colour, darker at the junction of the abdominal segments; the wing-cases were rather lighter in tint than the thorax and abdomen; the abdominal segments taper gradually to the anal segment when viewed dorsally; the anal segment has a square termination with a slight rounded protuberance in the centre; it is armed with a number (ten or twelve) of slender hooks. Each abdominal segment has a transverse row of rather prominent spikelets which point rearwards; on both sides of each abdominal segment is a curved spine, about 2 mm. long, which points to the rear, and which is emitted from a bulb immediately in front of the row of spikelets. The segmental divisions are clearly defined and the surface is roughened. The head is blunt in front and is without a cremaster, but has a slight bulb in the centre. The whole surface of the pupa is rather glabrous, but has a roughened surface.

Amongst my larvae there was no evidence of a desire to wander at pupation, and they spun silken cocoons within withered portions of the privet leaves. The imagines commenced to emerge on May 18th; reared out of doors they would no doubt have been several weeks longer in undergoing these transformations.

Youlgreave, South Croydon;
January 17th, 1920.

COSYMBIA PENDULARIA ab. *DECORARIA*, NEWM.

By LOUIS B. PROUT, F.E.S.

As readers of Seitz's 'Macrolepidoptera of the World' may have noticed, I have (iv, p. 142) resuscitated the above long-neglected name of Newman's for the now well-known dark forms of *C. pendularia*, Cl., and discussed, so far as space allowed, the history of the names assigned to these and the parallel dark form of *C. orbicularia*, Hb. But my notes in that work may not have reached the eyes of all British lepidopterists who would be interested in them, and there are moreover, other reasons for following up the matter a little further.

In the first place, the re-discovery of a dark form in the south of England, and its differentiation from the similar Staffordshire form which is generally called ab. *subroseata*, Woodforde, has reopened the question whether we require two varietal names for these or not. Then, as Mr. Joicey has just recently purchased Newman's type out of the Sydney Webb Collection (Stevens' Sale Catalogue, December 9th, 1919, lot ?), I have had my interest reawakened in the details, have been able to put the historic specimen side-by-side with beautiful Surrey examples bred by Mr. R. T. Bowman, and am therefore anxious to give to a wider public what I have already, some months ago, communicated to two or three correspondents in the nature of a "correction"—if so it may be considered—of my earlier work in "Seitz."

Newman in 1861 ("Zoologist," xix, p. 7798) erected *Ephyra* (?) *decoraria* as a distinct species—"a Geometer probably hitherto uncharacterised," to quote exactly his heading. He describes it as of "about the size of *Ephyra porata*. Fore wings with the costal and hind margins bluish lead-colour; disc of the wing tinged with delicate red, inclining to rosy; two very distinct pale grey transverse waved lines. . . . Exactly intermediate between the two lines is a conspicuous white spot transversely elongate" (etc.; the rest of the description is immaterial for our purpose). The type was lent by Mr. Shrosbree, who was said to have bred it in June, from a larva which he found in May, "feeding on the bedeguar of a wild rose." A few pages later (*tom. cit.*, p. 7807), Miller suggests, though with a query, that the specimen is an "*Ephyra pendularia*, var." After a further reference by Newman in vol. xx, of the same publication, p. 7874, the specimen apparently passes out of sight until the year 1876, when Mr. Bond, having acquired it, gives a note on its history accompanied by a good woodcut ("Entomologist," ix, p. 217). He says he "understood at the time"—(when the specimen was first exhibited before the Entomological Society)—"that the larva was never actually seen feeding on the bedeguar," and surmises that it had fallen from a birch tree. Neither he nor Barrett (who gives, in "The Lepidoptera of the British Islands," vii, p. 325, pl. 328, fig. 2d, a brief notice and a rather crude figure of the specimen) mentions Newman's name, and as its author himself had neglected to affix any type-label, it is not altogether surprising that it has been long overlooked. The locality, published as "near London," was, according to the label on the type, Birch Wood.

Newman's type, as description and figures show, is the smooth, uniformly darkened form which has recently been named ab. *nigro-roseata*, H. W. Wood ("Entom.," xlix, p. 80), and which, indeed, is the only melanic form as yet known from the southern counties (Surrey and Kent). It is rather small, which may be because it was a precocious second-brood example, or because it had pupated

somewhat prematurely through having lost its food-plant, but is otherwise perfect, though not unnaturally looking a trifle faded when placed beside freshly-bred Surrey specimens. I believe individual examples of the North Staffordshire form *subroseata* virtually match this form, and that the synonymy which I gave in Seitz (*decoraria*, Newm. = *subroseata*, Woodforde = *ianthinum*, Stichel) was by no means wide of the mark; but as by far the greater number are paler, more irrorated or more mottled and the distinction appears geographical, I propose the following synonymy for those who desire absolute precision :

(1) ab. *decoraria*, Newm., 'Zool.' xix, p. 7798 (1861) = *nigro-roseata*, H. W. Wood, 'Entom.', xlix, p. 80 (1916). Kent, Surrey.

(2) ab. *subroseata*, Woodforde, 'Entom.', xxxv, p. 276 (1902) = *decoraria*, Prout in Seitz, 'Macrolep.', iv, p. 142, pl. 5 c (1913) (nec Newm.). North Staffordshire.

(3) ab. *ianthinum*, Stichel, 'Berl. Ent. Zeit.', 1901, S.B., p. 20 (veins in distal area streaked with white). Arneburg.

LEPIDOPTERA IN NORTH STAFFORDSHIRE IN 1919.

By F. C. WOODFORDE, B.A.

On April 24th I went to North Staffordshire, proposing to myself a three months' stay in pursuit of entomology in that part of the world.

For the first few days very few insects were to be seen, but during the first and second weeks of May *Lobophora carpinata* was to be found sitting on tree-trunks fairly commonly, and among them were some nice banded examples. Searching for larvæ at night was very unprofitable, larvæ of *T. jimbria*, *N. baia*, *N. brunnea*, *A. tinete* and *B. repandata*, common in most years, being all extremely scarce.

In the middle of the month *Callophrys rubi* was flying in abundance, *Celastrina argiolus* was not uncommon, and *Brenthis euphrosyne* was to be seen, as also an occasional *Gonepteryx rhamni*; a fair number of *Lobophora viretata* sat on holly-trunks, and a semi-melanistic form of *Tephrosia biundularia* was common. About this time *Nola confusalis* appeared and was to be seen on tree-trunks, but not nearly so commonly as in the previous year. *M. hastata*, too, began to appear and was much more common than usual, but *Macaria notata* and *B. fontis*, both usually abundant, were scarce, and larvæ of *Chloroclystis debiliata* were hardly to be found at all.

Males of *Macrothylacia rubi* and *Saturnia carpini* assembled freely to breed females, but all were typical.

On the 26th I picked up on a tuft of heather near a poplar tree a freshly emerged female of *Dicranura vinula*. I put her

in an assembling box in the garden and sat up that night till 2 a.m. (summer time), but nothing came. I therefore left her and went in. Next morning, to my surprise, I found three males sitting on the box, so I sat up again, and found the males began to assemble at about 2.15, and they kept on coming to the number of twenty-nine till 3.30, when the flight appeared to cease.

On the 29th I was joined by Mr. Peed and Mr. P. C. Reid. One day we were lucky enough to get a freshly emerged female, *Cerura bicuspis*, and we went out together that evening to try to assemble males, with the special object of getting a pairing. Some males came, but though free access to the female was given they absolutely refused to pair; they buzzed all around, alighted and crawled round the female, and then one after another flew off. This continued for two or three nights and we began to get hopeless. The evening of June 9th was cold and I did not go out, but left the now long-emerged female in a pairing-trap in the garden, with a female each of *Notodonta trepida*, *N. dromedarius* and *Pachys betularia*. To my great surprise next morning when I inspected the trap I found all four females paired. All the females in due course deposited ova, but unfortunately the *bicuspis* ova proved unfertile.

During the day searching tree trunks was not very productive. *Acronycta leporina* was very scarce, only one or two being seen, and *E. pendularia* ab. *subroseata* equally so. (By the by, Mr. Prout now tells me that ab. *decoraria* of E. Newman is a different form, and that the name *subroseata* may be retained for the North Staffordshire form.) *Tephrosia extensaria*, however, was not uncommon. A good many *E. plumbeolata* were taken by stirring them up from patches of *Melampyrum*, and on sunny days some *Sesia culiciformis* and *S. sphegiformis* were taken flying and a few *Hemaris bombyliformis* were seen, but not caught. Some *Diacrisia sanio* (*russula*), both male and female, were taken at an unusually early date, and *Brenthis selene* was abundant all through the month.

During the month we tried sugar, but with not very much success, insects visiting it only in small numbers, but amongst those taken were three *Acronycta alni*. Larvae of this species had been unusually numerous in the previous August, but a large proportion were victims of parasites. My chief business was with Macro-lepidoptera, but when I saw insects of other groups that I thought might be of use to the Oxford University Museum I took them.

Among these were the very handsome dragonfly, *Libellula quadrimaculata*, L., whose habits are similar to those of *L. depressa*, which it very much resembles, save that it is infinitely shyer, and both Mr. Peed and myself found it impossible to catch by stalking, and only one was netted by chance as it passed close by in a high wind. Another was a "daddy,"

Xiphnra atrata, L., of which two or three of each sex were taken, but it was far from common. *Trichiosoma*, sp. ?, was very common flying over birches, and *Cimbex*, sp. ?, was not common. Single specimens of two not very common beetles, *Cosymbotis pectinicornis* and *Melandrya carabooides*, also were taken. I had some cocoons of *L. callunæ* from larvae got in the previous autumn, and from them emerged two specimens of the huge ichneumon, *Ophion undulatus*, a male and a female. In 1918 I obtained six in the same manner. I never saw it wild.

Towards the end of the month the weather became very cold, and this was accompanied by an almost entire disappearance of insects, and for more than a month hardly a moth was to be seen in the woods, sitting on tree-trunks or flying, nor did the beating-stick rouse any, and none were to be seen flying at dusk or coming to a light at night. And yet, though thus keeping themselves invisible, there were insects about, as shown by the pairing-trap. When females emerged in my breeding-cage, which was kept in a warm room, I put them out in the garden at night in the trap. In this way I got pairings of *S. populi*, *N. dromedarius* and *N. camelina* between June 30th and July 15th, —not always on the first night of exposure, but often after two or three days.

On July 23rd I gladly left the district for South Devon, where I should have gone much sooner but for the impossibility of getting rooms at an earlier date in the place in which I wished to stay. There I came into summer again, which, I was told, had been unbroken by any cold spell such as had troubled the Midlands.

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CONTRIBUTIONS TO OUR KNOWLEDGE OF THE BRITISH BRACONIDÆ.

No. 5.—SIGALPHIDÆ.

By G. T. LYLE, F.E.S.

(Continued from Vol. LII, p. 181.)

This is a group of small obscure insects constituting, in Ashmead's classification, a separate sub-family, and placed next to his sub-family *Cheloninæ*, immediately after the tribe *Calyptini* —a division of his sub-family *Blacini*. Other authors have been inclined to link the group more closely with the *Chelonidæ*, but to me this seems somewhat arbitrary, for though both have the abdomen connate above and forming a carapace, in the *Chelonidæ* the character is the much more pronounced. In other characters

the two differ widely; indeed, the *Sigalphidæ* in some respects more nearly approach the *Calyptidæ*.

These insects have two cubital cells on the fore wings, radial cell ovate, not reaching the apex of the wing and rather larger than the stigma; abdomen sessile, subovate, usually with the sutures fairly well marked, and terebra exserted, in some cases equalling the body in length. Our British species may be divided into two genera as follows:

- Five abdominal segments visible from above, second longer than third, and cell divided by an indistinct transverse nervure.....*Allodorus*.
- Three segments only visible from above, second shorter than third, anal cell undivided.....*Sigalpus*.

Allodorus, Forster.*

Although separated from *Sigalpus* by Forster, the genus was first described by Marshall† from a single male, presumably of *A. lepidus*.

Forster made a type of the Neesian species *semirugosus*, which insect Marshall doubtfully recorded in his catalogue, though afterwards he considered it "too dubious to be retained as a British insect." Writing in 1888,‡ however, he tells us he has discovered several previously misnamed specimens in his own collection, some taken in Mar Forest by himself and others by G. C. Champion in the Highlands.

Our only other British species is *A. (Triaspis) lepidus*, Hal.,§ which seems to be rare.

I am unacquainted with both, and nothing whatever appears to be known of their life-histories; it is probable, however, that they have habits similar to those of the members of the next genus.

Sigalpus, Lat.

Contains the great majority of our species, several of which are known to be parasites of the larvæ of *Coleoptera* (*Curculionidæ*), and it is quite probable that all have the same habit. I am aware that the breeding of one species from a leaf rolled by a larva of the lepidopteron, *Halias quercana*, has been recorded, but in this case it is probable that the leaf had also been tenanted by a larva of an *Orchestes*, and the same may apply to Van Vollenhoven's record of the rearing of *S. caudatus* from *Tortrix hypericana*. One cannot so easily dispose of Curtis's observation

* 'Verh. pr. Rhein.' 1862, p. 242.

† 'Trans. Entom. Soc.', 1885, p. 103.

‡ *Ibid.*, 1889, p. 160.

§ 'Ent. Mag.', iii, p. 125.

|| 'H. N.', iii, p. 327.

of the destructive dipteron *Oscinus restata* as a host of *S. caudatus*, though it will be noticed he does not actually say that the parasites emerged from the larvæ or puparia of the Frit Fly, but merely from stems of barley containing larvæ. There seems, therefore, a possibility that the sigalphid preyed upon some coleopteron infesting barley, which hypothesis is perhaps strengthened by the fact that recently large numbers of the Frit Fly have been reared at various schools of agriculture, but so far as I can learn no examples of *S. caudatus* have been obtained from them, although other parasites, notably *Chasmodon apterus* and a cynipid (species ?), have appeared in numbers.

Eight species only are known from Britain, but no doubt others will be discovered. *S. thoracicus*, Curt., an insect with the thorax red and all the legs ochreous, has been added to our fauna on the strength of a single female (the type) bred by Curtis from Sicilian beans. As the species is said to be common near Palermo and its solitary occurrence here was probably accidental, it is doubtful if the name should be retained on the British list.

Of three of our species, *ambiguus*, Nees, *luteipes*, Thom., and *striolatus*, Nees, I know nothing. On the continent *luteipes* has been reared from *Ochina hedere* and *Anobium rufipes*, while *striolatus* is recorded from *Pissodes notata*.

Pallidipes, Nees.*

This is the *Triaspis fulripes* of Haliday,† a small stout species with testaceous legs, the terebra as long as thorax and abdomen combined, and the antennæ with 22–23 joints. Marshall, Bignell and Morley appear to have had no personal knowledge of the insect, which seems somewhat strange, as I have found it to be far from uncommon. In the New Forest it is a very frequent parasite of the larvæ of *Orchestes fagi*, the imagines emerging in June from their brown cocoons, which are formed within the blisters made in beech leaves by the hosts. These cocoons much resemble the puparia of certain *Tachinidae* minus the spiracles—a fact which Marshall mentioned, noticeably those of *Actia reducta*, Villen, which are often found within leaves rolled by larvæ of Tortrices. I have also reared it from the same host taken in the beech plantations on the Gog Magog Hills, Cambridge, as well as from the larvæ of an *Orchestes* on elms at Coton, Cambs. *Orchestes quercus* is another host from which I have several New Forest records.

A hyperparasite, a species of *Habrocytus*, is frequently reared from cocoons of *S. pallidipes* taken in the New Forest; this must not be confused with another insect, *Tetrastichus ecus*, Wlk.,

* 'Mon.' i, p. 270.

† 'Ent. Mag.' iii, p. 127.

which is a common primary parasite of *Orchestes fagi*. I am greatly indebted to the Rev. James Waterston, of the British Museum, for naming these two Chalcids.

Caledonicus, Marsh.*

The largest species we have, measuring 4 mm. in length. Described from a specimen taken on the Grampian Hills. A single female of this very distinct species, presumably the type, is in Marshall's collection, now in the British Museum.

Caudatus, Nees.†

A small species with the third abdominal segment shining and not obtuse and the terebra of female as long as head, thorax and abdomen combined; very similar to *floricola* and *pallidipes*, though in the female the longer terebra easily distinguishes it from both. Were it not that the legs of *pallidipes* are lighter in colour (not, however, always clear rufous), the males would be extremely difficult to separate from that species, while males of *caudatus* and *floricola* appear almost identical; in the latter the third abdominal segment is somewhat more shining and possibly the hind tibiae are rather more clearly rufescent banded, also *caudatus* is slightly the larger.

In my specimens the stigma is nigrofuscous, as described by Nees, and not black, as mentioned by Marshall; also in one female the first abdominal suture is obscurely rufous and there are traces of two rufous bands on the disc of the first segment. Antennæ of all males 21-jointed and of all females 20-jointed, with one exception, where the number is 19.

Nees says, "Habitat in floribus umbellatis hortorum"; and in my garden at Brockenhurst this was a particularly plentiful insect, numbers being attracted by the flowers of *Daucus carota*, females predominating. I did not take it, however, before the middle of July or after the first week in August. On August 25th, 1918, a single female was taken at the Fleam Dyke, near Cambridge, and on September 22nd, 1919, I discovered another crawling on the mudguard of a motor-car at Willingham, Cambs. It would appear from this that the insect is double-brooded. Marshall apparently had no personal knowledge of the species, but mentions that Ratzeburg and Nardlinger bred it from *Orchestes quercus*. Although I have reared numbers of *pallidipes* from the curculio, *caudatus* has never occurred.

Floricola, Wesm.‡

Very similar to *caudatus*, but rather smaller, and in the female the antennæ are distinctly shorter and more thickened,

* 'Sp. Hymen. (Braconidæ),' i, p. 317.

† 'Mon.,' i, p. 268.

‡ 'Norw. Mem. Ac. Brux.,' 1835, p. 208.

while the terebra is shorter than the abdomen. Also resembles *obscurellus*, though, of course, considerably smaller and having the third abdominal segment more shining.

I have come across very few examples; one female from the Gog Magog Hills, Cambridge, May 20th, 1917, another from a shady lane at Hunstanton, June 4th, 1918, and a third taken on young beeches growing on a heath at Snettisham, Norfolk, July 15th, 1919, are the only specimens I possess.

Obscurellus, Nees.*

This is not the *obscurellus* of Haliday,† which is proved by Marshall to be a synonym of *floricola*, Wesm. (see 'Trans. Entom. Soc.', 1885, p. 108).

A robust species measuring 5–6 mm. in length, with the third abdominal segment entirely and noticeably simulose and terebra equal in length to the abdomen. Bignell reared it from larvæ of *Gymnetron noctis*, and in September, 1918, Dr. E. A. Cockayne sent me twenty-two bred from the same host, which he found commonly at Limber, North Lines., feeding on toadflax.

BUTTERFLIES IN MACEDONIA.

BY HERBERT MACE.

(Continued from p. 42)

P. machaon.—A very common butterfly wherever I happened to go during the summer months. In September, 1917, it simply swarmed on a dry hillside near Janes. It appeared to be attracted by a very tough species of umbelliferous plant which is notable for remaining brilliantly green while all the surrounding herbage is dried up; and on this plant the larvæ were present in all stages. *Machaon* is more subject to variation than is commonly noted, and my Macedonian specimens differ from those found in our fens. The ground-colour is paler and clearer yellow, and the scales on the nervures of the fore wings are much less thickly placed, the nervures, in fact, being almost thin clean lines. The black markings in general are much paler, and the submarginal band is noticeably narrower throughout. In several specimens the blue lunules are larger and brighter than in British specimens, and one or two have the first and second yellow lunules on the hind wings filled in with deep orange. I took one female of exceptional size, being 4½ in. across the wings, and the general appearance is much more bold than the usual type. It was on the wing from the beginning of April to the end of

* 'Mag. Ges. Berl.' 1816, p. 252.

† 'Ent. Mag.' iii, p. 126.

September. Its flight is different from *podalirius*, for, although swift, it rarely rises more than a few feet from the ground.

Thais polyxena.—An early species which always attracted notice where it was found, but rather local, preferring, as a rule, ravines in somewhat elevated places and I only found it where there was a perennial stream handy. Its flight is short and jerky, and it frequently settles with expanded wings on flowers or the ground. The half dozen specimens I brought home are all variable and neither agrees entirely with Kirby's figure, which shows no red spots on the upper side of the fore wings. In each of mine one is present on the costa just beyond the middle, one specimen has another near the base, and a third has a rather large one in the middle of the inner margin. The hollowed shape of the hind wings is particularly noticeable beneath and the underside of the wings is really very remarkable in appearance, the red costal spots and orange-bordered nervures being very striking. I found it on the wing from the middle of March till the end of May.

Aporia crataegi is an insect which does not vary much from the typical form, but the specimens I brought back differ from my British ones in having the triangular patches at the ends of the nervures very slight or non-existent. One exceptionally pale brown female has the disco-cellular nervules entirely without scales. It was a common insect in the month of May, and in certain places it simply swarmed and was far and away the commonest white while it lasted. It was very pretty to watch the males courting a female, who used to sit on a flower head, fluttering in most perturbed-looking fashion, while two or three males hovered round, jostling each other and making the most strenuous efforts to secure the lady's favour. One frequently saw them on dull days resting on clover flowers, of which they seem inordinately fond, and they were more readily recognisable by their curious hanging attitude than when in flight. On one occasion I saw twenty-five of these insects congregated on a patch of damp sand imbibing the moisture and one or two of them were spotted with pink, presumably from some fluid which had been splashed over them. Ova, laid on the upper side of the leaf, larvae and pupæ were to be found on the sloe, which, in the form of tiny shrubs, is abundant all over the country.

Pieris brassicæ.—Not nearly so common in Macedonia as in Britain, where the enormous amount of cabbage and allied plants cultivated encourages it, as well as the following species. The earliest note I have of its appearance in Macedonia is February 4th, 1918. I took two varieties of unusual form, one with the apical spot very grey and faint, the other a male with the discal spot beneath larger than in the type and united by a narrow band; the lower spot extends to the hind margin and near the costa is a small double spot, the whole arrangement suggesting a broken band across the wing.

P. rapae.—Moderately common, but never so abundant as in England. Unlike many other species, I found this frequently very much smaller than British specimens, and much less heavily marked. One female has an additional spot adjoining the apical blotch and in line with the normal central spots, and I have some doubt whether this may not be a specimen of *P. napi*, totally lacking the thickened nervures. I never saw this species earlier than the second week in March.

P. napi.—I seldom saw this insect and have only one specimen amongst the collection I sent home. This is a male which has only faintly indicated nervures on the upper side and the bases of the wings not black. Beneath, the veining is faint, but the spots, notably the one near the apex, are very distinct.

Pontia daplidice.—Was quite the commonest white throughout the season. Whether in the plains, cornfields, ravines or on the broken hillsides it could be found all through the summer. The later brood, appearing about the middle of July, was particularly abundant, and swarmed in the Janes plain all through that month and August. The extent of marking is variable. I have but one specimen which is specially different—a female only 35 mm. in expanse and heavily marked above and below. This butterfly deposits its eggs on several different crucifers, selecting small specimens and laying on both flower and leaves.

Euchloe ausonia.—The resemblance of the “orange-tips,” which have no orange patch, to the extremely common *P. daplidice* is so close that it is quite probable I overlooked some of these. In any case I did not once see an orange-tipped species, and although I occasionally saw what looked like females of *E. cardamines*, the specimens I sent home are all of this species. They vary from 44–53 mm. in expanse. Three agree with Kirby's description of var. *esperi*; a fourth would appear to be var. *crameri*. In this specimen the hind wings do not extend beyond the abdomen, but in the larger form they are fully half-an-inch below it. These were taken near Kukus in the months of April and May.

Colias hyale.—Very abundant throughout the season, though I do not remember having seen it before April. On the other hand, it was on the wing until well into November. Unlike *edusa*, it seems to prefer the plains and is less strong on the wing than the more common species.

C. edusa.—A most abundant insect wherever I went, its chief haunts being the sides of the stoniest hills, the plains and ravines being only sparingly visited. The second week in March is the earliest date on which I saw it, and it continued more or less common till the end of November, fresh specimens appearing about the end of June. The var. *pallida* (*helice*) was moderately frequent, and general variation from the typical form followed on the same lines as usual with this species.

Gonepteryx rhamni was moderately common over the whole period, but never specially abundant. I saw more than anywhere else at Karasuli in November, 1916, and at Sarigueul in the following spring there were a few specimens in the ravines. None of those I saw differed from the normal.

Dryas pandora is the largest and handsomest of the fritillaries met with in Macedonia. It ranges from $2\frac{3}{4}$ to $3\frac{1}{4}$ in. in expanse, the females distinctly larger than the males. The markings on the upper side are almost precisely similar to those of *paphia*, the males having the familiar bars on the nervures, but the ground-colour in both sexes is much more greenish. The males are almost the exact colour of var. *valesina* and the females even darker and greener. The latter have a distinctly yellow patch below the costa of the fore wings, wider towards the tip. In the months of May and June, 1917, I saw solitary specimens in some of the ravines near Kukus, but in the autumn it was in great profusion in a ravine a mile or so to the south of Janes, and in the following spring it was even more abundant at the same place. Unlike *paphia* it is not at all strong on the wing, the flight being heavy, and it rests frequently, either on the ground, or plants. On a certain clump of acacias I found numbers resting with closed wings on the underside of the leaves, where the soft green of the underside proved strikingly protective. It is more gregarious than any other fritillary I have met, and, indeed, its habits are quite different from those one associates with the British fritillaries.

According to Kirby, the larva feeds on the wild heartsease, but there was very little of this to be seen in the neighbourhood in question. I only paid one or two flying visits to the place and did not see any females ovipositing.

Issoria lathonia, regarded as such a prize in England, was, next to *M. phœbe*, the commonest fritillary in Macedonia. The earliest note I have of its appearance is the middle of March, and it was abundant down to the end of June. Although frequent enough in the ravines, I found it more addicted to tracks and roadsides than most fritillaries, and in this respect it resembles the "Wall," which it is not unlike in appearance on the wing. I took several fine examples. None vary from type, and the size ranges from 44 mm. in the males to 54 mm. in the females.

Melitaea didyma I first met on a rounded hill close to the destroyed vineyards of the monastery near Kukus, about the middle of May, 1917, and it was very abundant there for about three weeks. I did not see it again till the following year, when it was very frequent in the cornfields around Armutci village. It is a bold insect, flaunting itself freely before one as it sails gracefully from flower to flower. I greatly admired the rich reddish colour of the male, which does not vary much, either above or below. The sexual difference is striking, the

female being paler, but heavily suffused with greenish-black on the fore wings and the inner margin of the hind wings. They vary much more than the males, some being very much darker than others. Beneath, one of my females has the black dashes reduced to thin lines and the marginal spots much smaller. The average size is about 50 mm. I have one abnormally small specimen which does not exceed 33 mm., is very pale and faintly marked, and the spots are greatly reduced in size and number.

M. trivia.—I took one specimen only of this species, flying in company with *didyma* at the monastery.

M. pharbe.—An abundant species from the end of April to June in the ravines near Kukus and near Janes and Armutci. Habits somewhat like *didyma*, but disposed to fly higher and further. I have one specimen in which the dark markings of the upper side are much reduced. Beneath there is considerable variation, the ground-colour ranging from faint greenish-white to deep yellow and the size and shape of the markings also varies greatly.

Polygonia c-album.—I saw one specimen of this insect on the top of a windy hill near Janes in March, 1918.

Eugonia polychloros.—One specimen of this fine butterfly haunted some elm trees in the churchyard of the village of Armutci for some days in April. I never saw another at any time, but the elm is so abundant in the country it should certainly be more common.

Vanessa io.—Two specimens seen, one in June in a ravine near Kurkut and one in March at Armutci.

(To be continued.)

NOTES AND OBSERVATIONS.

THE SYDNEY WEBB COLLECTION.—A third portion of this collection was sold at Stevens' Auction Rooms on Tuesday, February 10th, and again attracted a large attendance of buyers. The portion of the collection offered included the remainder of the Geometers, the Sphinges, Bombyces, etc., the feature of the day's sale being the "Tigers," of which between thirty and forty more or less remarkable varieties were considered worthy of being offered singly. An *Aretia caja*, a full-sized cream-coloured specimen figured by Barrett, pl. lxxi, fig. 1b, established a fresh record for a single insect at £26; a smaller light-coloured example, Barrett, pl. lxxii, fig. 1b, made £20, and a lightly marked pale variety £15, while the others went from £9 down to 20s. each. The best *A. villica*, a very remarkable yellow insect with hardly any markings, Barrett, pl. lxxiii, fig. 1e, perhaps the best variety in the sale, made £21; one with hind wings deeply suffused with black, Barrett, pl. lxxiii, fig. 1f, £8 10s.; and the others, although some of them "figured" specimens, from 45s. to 10s. each, the total realised for the whole of the series of these two species

being just over £220. The other more important lots among varieties included one of five *Strenia clathrata*, of which two were very dark, and one rayed, which made £3 10s.; three *Ematurga atomaria*, of which one was an almost unicolorous pale form £5; and three *Loma-spilis marginata*, one white with black central band 50s. A deep pink *Deilephila euphorbiæ* made £5 15s.; a long lot of *Zygæna lonicerae*, in which were included a specimen all pink except margins and one pale with hind-wing margins golden, Barrett, pl. lix, figs. 3b and 3c, £7; a *Senta irrorrella* with outer third of fore wings black and with three basal streaks £3; a lot of two *Hypocrita jacobææ*, one yellow and the other dusky, 45s.; two black *Callimorpha dominula*, one a bit of a rag but the other a good specimen taken by the late Mr. S. Smith, of Walmer, Barrett, pl. lxx, fig. 1e, 5 guineas; a "hermaphrodite" *Lasio-campa quercus* £6 10s.; a similar *Ocneria dispar* 25s.; a black *Spilosoma menhastræ* and another dark with a streaked *S. mendica* £4 the lot; a male *Saturnia paronia* (*carpini*) without ocelli £12, and a "hermaphrodite" £7 10s.; and a black *Aeronycta striyosa* 5 guineas. But there were plenty of cheap lots also even among the varieties; two *Zygæna meliloti* with red forewings, figured by Barrett, pl. lix, fig. 1b, in a lot of 105 specimens including several good confluent *Z. trifolii* and others failed to go above 26s., and for a lot of thirty-three insects in which was included a confluent spotted *Zeuzera cæsuli*, a by no means common form, only 6s. was obtained. Among the "rarities" nineteen *Sterrhæ sacraria* made just over 4s. apiece; a lot including a dozen *Madopa salicalis* and one *Pyralis lienigialis* £2 2s.; lots of 3 *Deilephila euphorbiæ* and 4 *D. galii* 50s.; 3 *D. euphorbiæ*, 3 *D. galii* and 3 *Phryxus livornica* (*lineata*), 80s.; 2 *D. livornica* and 6 *D. galii* 12s.; 3 *P. livornica* and 2 *Hippotion celerio*, one bred, £9; 3 *P. livornica* and 3 *H. celerio*, also one bred, £4 10s.; 3 *H. celerio* and 2 *Daphnis nerii* 16s., and so on, the range in price possibly depending upon the condition of the insects to some extent, but also upon the would-be purchaser's faith in the accompanying data. *Deiopeia pulchella* made round about 10s. each on the average; *Epienaptera ilicifolia* sold singly from £3 10s. to 40s.; the solitary *Gluphisia crenata* of the collection, "Isle of Man, bred 1870," £3 10s.; *Lælia cœnosa* from 10s. to 5s. each according to condition; *Drepana harpagula* (*sicula*) just over 7s. each on the average; and the three *Notodonta bicolor* £3 15s., £4 10s. and £6 10s. each. The total of the day's sale just exceeded £550. The fourth portion of the collection will be offered on Tuesday, March 9th.—R. A.

NOTES ON EUCHLOË BELEMIA, ETC.—On p. 163 of the 'Entomologist,' lii, Basra was by a mistake quoted as the locality for *Euchloë belemia* and *Zegris eupheme*. It was on and near the Jebel Qizil Robat, a low range of hills about 600 ft. elevation by the R. Dyala, and some twenty miles from the Persian border of Mesopotamia, where these two species were common last spring. Of *E. belemia* there were two very distinct broods: (1) January and February or "wet season" form: Upperside—black markings dense and bases of wings black; underside—broad green bands and narrow white ones. (2) March and April or "dry season" form: Upperside—black markings less pronounced, bases of wings

white; underside—narrow broken yellowish-green bands and broad white ones. The sexes are similar in colouring and markings, though the female is slightly the larger on the average. I bred out an example of the second brood from one of three larvae found on seed-stems of a yellow-flowered crucifer like mustard, which served as food-plant also of *Pontia daplidice* and *Zegris eupheme*. As with *Euchloë lucilla* on the North-west Frontier of India I found *E. belemia* hurrying about the crests of stony ridges, where *Melitaea didyma* and *P. machaon* occurred. I took a good series of *belemia* and three dark aberrations. The misquotation "the Doll butterfly" and "? Hytha (Nytha) species" refers to *Satyrus telephassa*, common on Jebel Qizil Robat, and abundant at Khanihin (October) and in North Persia (July to September). At Qizil Robat I took also *Satyrus anthe* var. *enterrata*, a glorified "grayling," which settled on conglomerate rock. I also there bred out some forty examples of *P. machaon* from larvae fed on *Ruta tuberculata*, and found three more of its food-plants, all belonging to the Umbelliferae. In the first week of December I found on a thorny bush on the Piris Dagh Pass in Kurdistan two cocoons containing fragments of the pupa-cases of a moth related to the Moon-moth. The only butterflies that I saw near there were one *Pieris rapae*, two *Teracolus fausta*, and several *Colias edusa* and *Pyrameis cardui*. Of birds Magpies were remarkably common, and I saw the English Robin and heard his cheery little song again. The Indian Robin seems to have got up late and left its chest behind, and so cannot claim the name of Redbreast.—H. D. PEILE, Lieut.-Col. I.M.S.; Mosul, December 15th, 1919.

RETARDED DEVELOPMENT OF *CENONYMPHA TIPHON* LARVÆ.—At the end of July, 1918, I obtained a few eggs from a female *Cenonympha tiphon* captured in Perthshire, and these hatched about the middle of August. The larvae were confined on potted plants of grasses, chiefly fescue-grass, covered with gauze and kept out of doors under natural conditions as far as possible. Since the time of hatching they have been now and again examined, the last time being at the end of last October, when I found five apparently quite healthy and preparing for hibernation, and they were then only about one-third grown and *sixty-two weeks* old. Should they survive their second winter and finally attain full growth it will prove an interesting record, as I am not aware of another instance of this species passing through two years before completing the metamorphosis, but possibly it may not be unusual for a certain number of *tiphon* larvae to do so in a state of nature in their northern habitat, being subjected to such severe climatic conditions.—F. W. FROHAWK; January, 1920.

HIBERNATION OF *AGLAIS URTICE*.—I should like to confirm the observations of south country entomologists with regard to the appearances of this butterfly last year. In my district we had an unusually large number of hibernated specimens in the spring; in fact, it and *Euchloë cardamines* were by far our commonest spring butterflies, the latter being remarkable to me for showing an unusually large proportion of extremely fine females. There were plenty of the larvae of *Aglais urticae* to be seen, but the summer brood was almost

non-existent, and I have only seen one insect in hibernation this winter.—HAROLD D. FORD; Thursby Vicarage, Carlisle.

WINTER MOTHS.—Mr. Claxton asks (*antea*, p. 17) a question as to the scarcity of winter moths. I do not think such scarcity has been apparent this winter in this district. Ivy blossom was disappointing, but from November onwards the ordinary winter moths were in full evidence here. *Cheimatobia brumata* and *C. boreata* were in full numbers; *Hybernia defoliaria* above the average. *P. populi* has visited me at light for the first time, as did *Ennomos alniaria* for the first time since 1912. On the other hand *Himera pennaria* was exceedingly scarce, while with *Hybernia aurantiaria* I had a curious experience. Wishing to obtain some females, I dug about fifteen pupæ; from these two males and eleven females emerged. From similar observations with regard to *H. defoliaria* and *Phigalia pedaria* I am beginning to believe that the females of some of these wingless species exceed the males in numbers. Can any other collector confirm this observation?—HAROLD D. FORD; Thursby Vicarage, Carlisle.

PARGE MEGÆRA IN HERTS. AND NORTH-WEST MIDDLESEX.—Mr. H. Rowland-Brown made some interesting remarks on this species ('Entom.', vol. li, p. 233) and its occurrence in 1918 in Herts and Middlesex, and it has been a great pleasure to me to note in 1919 that this species is making steady progress in Herts. My friend, Mr. Chas. Oldham, of Berkhamsted, reports the insect in his district for the first time during twelve years' acquaintance with that locality. In August I saw *P. megæra* in several places between Watford and St. Albans, and also in the neighbourhood of Radlett.—ERNEST W. NIMMY; 210, Whippendell Road, Watford, Herts.

BUTTERFLIES OBSERVED IN THE ISLE OF SHEPPEY, KENT, 1919.—These observations were made while I was stationed at the R.A.F. Station, Eastchurch, and I believe I can state that they are fairly comprehensive, all my available spare time having been spent thereon. I found the island very poorly represented in Lepidoptera of all kinds. Many species found on the mainland near by were not represented at all, notably *G. rhamni*, *A. thaumas*, *P. egeria*, *P. megæra*, while others were only represented by single specimens. *Pieris brassicæ*; *P. rapæ*; *P. napi* (not very common); *Euchlöe cardamines* (one specimen only—a male); *Colias edusa* (one specimen only; flew over the top of a hangar and evaded capture); *Vanessa urticæ*; *V. io* (one specimen only); *Pyrameis atalanta*; *Epinephele ianira* (extraordinarily plentiful; one newly-emerged female was taken on the wing having all the orange replaced by greyish-white and the apical spots barely decipherable); *E. tithonus* (very plentiful); *Cnonymptha pamphilus*; *Callophrys rubi* (one specimen only); *Chrysophanus phlæas*; *Lycæna astrarche*; *L. icarus*; *Cyaniris argiolus* (two specimens only; both observed in the spring); *Hesperia malvæ* (one specimen only); *Adopæa lineola* (very plentiful on the aerodrome towards the marshes to the total exclusion of *A. thaumas*); *Augiaudes sylvanus* (plentiful).—E. B. BETTS; H.M.S. "Pegasus," Rosyth, Scotland.

GRAPTOLETHA ORNITHOPUS.—On New Year's Day I took a specimen of *Graptolitha ornithopus* at rest on the trunk of a pine tree at Rockbourne (Hants). It was quite lively, and I had some difficulty in boxing it without injury.—A. STEVEN CORBET: Sidmouth Street, Reading.

LOBESIA PERMIXTANA, Hdn.—As far back as August, 1902, in speaking of the food-plants of this pretty little Tortrix ('Entom.', vol. xxxv, p. 209) I remarked that the larva "is almost sure to be found on oak as well some day." Fourteen years after, early in July, I was collecting near Brentwood, and from a shrubby oak I beat out two little dark-coloured, extremely active larvae that were quite strangers to me. Upon examining them carefully at home I came to the conclusion that they must be larvae of *L. permixtana*, the moth being common there. Both were full fed and spun up the next day, turning a lobe of an oak leaf over something like an *Ornix* but not so flat. On May 31st, 1917, a male appeared, and upon examining the other one I found it had pupated but was dead. I think oak must be its favourite pabulum in this part of the country, but I have certainly beaten the imago from birch as well. It is a curious little species, and I never could quite make up my mind as to its proper position in the cabinet. Like *Anisotenia ulmano* and *Hysterosia inopiana* its position in our list seems somewhat dubious. By *Betula "glutinosa"* Dr. Wood means our common birch. This name is used by many authors of botanical works. Babington and Gibson in their floras of Cambridgeshire and Essex respectively use this specific name, treating *alba*, Linn., as distinct; Brewer ('Flora of Surrey') on H. C. Watson's authority, makes *glutinosa* a variety of *alba*. To me the "common birch" has always been known as "*glutinosa*."—A. THURNALL; Wanstead, Essex, February 2nd, 1920.

ICHNEUMONS PARASITIC ON SPIDERS.—Among a lot of other parasitic Hymenoptera recently received for determination from Mr. Lane A. Carr, of Lichfield, I found a specimen of the Pimplid, *Aerodactyla degener*, Hal. This is a well-known parasite of the smaller spiders, but it has not hitherto been bred from the present host. Mr. Carr tells me that on May 19th, 1919, he took *Theridion denticulatum*, Walek., with an ichneumon larva upon its abdomen; the latter was lying right across the base upon the upper side. The next day the spider was certainly alive in the early morning, and perhaps also at night. On the 21st the spider was dead; the larva had completely emptied its host's skin, and now hung from the lid of the box in the shape of a pot-hook, with the head upwards. On the 22nd it had spun a long, slim, very thin white-silk cocoon. On the 28th the larva had changed in shape to that of the perfect insect, but was still dead-white in colour. On the 31st the imago was nearly complete, and the pupa was turning black from the head downwards. But not till June 4th did the imago become perfect. The host was found at Maple Hayes, Lichfield. From the same host, taken about Lichfield in 1917, Mr. Carr has bred a female of another Ichneumonid, the Cryptid *Hemiteles tristator*, Grav. This

species does not seem to have been reared from Arachnida since Brischke first bred it from *Epeira diademata* in Germany about 1870.—CLAUDE MORLEY; Monks Soham, Suffolk.

'ANNALS OF TROPICAL MEDICINE AND PARASITOLOGY.' Liverpool. Vol. xiii, Nos. 1 and 2, May 12th, 1919, and July 31st, 1919.—The former contains one paper of direct interest to entomologists—"On the Genital Armature of the Female Tsetse-flies (*Glossina*)," by A. M. Evans, M.Sc. In all seventeen species are referred to, and the paper is illustrated by eighteen excellent figures.—W. J. L.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—November 13th, 1919.—Mr. Stanley Edwards, F.L.S., President, in the Chair.—The decease of Mr. W. J. Ashdown (1895) was announced.—On behalf of the Rev. C. R. N. Burrows, a series of larval cases of various species of British Psychides were presented to the Society's collections.—Series of *Noctua xanthographa* were exhibited by Messrs. R. Adkin, A. E. Tonge, B. S. Williams, Hy. J. Turner, etc., and a discussion took place.—Mr. H. J. Turner gave a list of the named forms with short descriptions, and mentioned the characters which were available for variation as the ground, the stigmata, the transverse markings and the scale textures. Several members remarked on the extremely large numbers of this species which came to sugar.—Mr. Newman, a very dark-banded large form of *Cirrhædia xerampelina* from Sligo and males of *Ennomos angularia* from Regent's Park, with considerable contrast between the light central band and the dark outer-marginal area.

November 27th, 1919.—The President in the Chair.—Annual Exhibition.—Mr. S. G. Castle-Russell exhibited aberrations of the following British Lepidoptera: *Dryas paphia*, rayed and suffused, varied *valesina* forms, intermediate, bleached, blue shade below, etc.: *Limenitis sibilla* ab. *nigrina* underside; yellow-tipped *Euchloë cardamines*; *Brenthis euphrosyne* rayed, cream-coloured, etc.: *Cœnonymphia pamphilus*, a very pale series: *Aphantopus hyperanthus*, a long series of bred ab. *lanceolata*; *C. tiphon*, long series of aberrations, pale, ab. *lanceolata*; *Celastrina argiolus*, a perfect gynandromorph and colour forms; *Agriades coridon*, a perfect gynandromorph, ab. *syngrapha*, *striata*, ab. *obsoleta*, etc.; *Plebeius aegon*, eighty aberrations, ab. *striata*, ab. *obsoleta*, etc., and forty females with one wing shot with male blue coloration and the smaller; all taken or bred in the last two or three seasons.—Mr. T. H. Grosvenor, a pair of *Attacus edwardsi* from the Khasia Hills and a large number of Scorpions taken in the Punjab, N.W. Provinces, etc.—Mr. B. S. Willianis, a series of *Lomasplilis marginata* from Finchley showing an extreme range of variations.—Mr. E. E. Green, (1) *Papilio bianor*, taken at Camberley; (2) a series of *Parascotia fuliginaria*, taken at light at

Camberley. (3) two *Agrotis saucia* ab. *margaritosa*, taken at sugar; (4) aberrations of *Luperina testacea* and *Himera pennaria*; (5) *Stephanitis rhododendri*, an introduced pest of rhododendrons; (6) the rare Hemipteron *Corizus maculatus* from birch; (7) a contrivance of an iron ring and muslin for covering cylinders, jars, etc., for breeding.—Mr. A. E. Tonge, an *Amorpha populi* entirely devoid of marking, and the very rare Noctuid *Cloantha polyodon* (*perspicillaris*) from Worthing.—Mr. Leonard Tatchell, two very dark *Arctia caja*, one having scarcely any traces of cream on the fore wings.—Mr. R. Adkin, series of the British species of *Nolidae* and *Nycteolidae*, illustrating their range of variation.—Mr. L. A. Box, examples of the more common species of the parasitic Chalcids.—Mr. C. W. Sperring, a selection of aberrations of *Mimas tiliae*, *Brenthis euphrosyne*, *Agriades coridon* and *Plebeius aegon*.—Mr. Percy Bright, very long series of aberrations of *Brenthis euphrosyne*, *B. selene*, *Chrysophanus dispar* and *Rumicia phleas*, with the rare ab. *alba*.—Mr. K. G. Blair, the black form ab. *nigra* of *Cetonia aurata* from St. Mary's, Scilly, 1919.—Mr. Johnston, a series of aberrations of *D. paphia* and *L. sibilla* from the New Forest, July, 1919.—Mr. H. A. Leeds, a large number of aberrations of *P. icarus*, *A. medon* and *A. coridon*, named by Tutt's 'Brit. Lepid.' no less than eighteen being of the last species, and of *A. hyperanthus*, *H. malvae*, *E. jurtina*, *S. pruni*, etc.—Mr. R. South, aberrations of *B. selene*, confluent and suffused; *C. pamphilus*, pale splashed and dark; silvery-grey *Tortria eratogaana* and dark suffused *T. xylosteana*.—Mr. Curwen a very fine selection of *Zygænidæ* from Italy, including many striking races and aberrations of *Z. transalpina* from Central Italy; races of *Z. stockadis*, *Z. achillea*, *Z. ory tropis*, *Z. carniolica*, *Z. punctum*, *Z. erythrus*, etc.—Mr. Clifford Craufurd, aberrations of *D. paphia* and *L. sibilla*.—Prof. Bateson, drawings of flowers produced by plants propagated as root cuttings to compare with flowers produced by normal plants grown from seeds.—Mr. H. Moore, various forms of *Danaida chrysippus* and *Hypolimnas misippus*, and read notes on the association of the two species.—Mr. A. W. Mera, bred series of *Tephrosia crepuscularia* and *T. brunnularia*, with melanie and hybrid races.—Mr. A. A. W. Buckstone, aberrations of *Colias edusa*, dark and pale ground; *Callophrys rubi*, pale blotched; *Pieris brassicæ*, green lined; *Triphaena fimbria*; *T. comes*; ab. *unguiflvrata* of *Semiothisa liturata*, etc.—Mr. C. W. Colthrup, aberrations of many British butterflies taken in 1918–19, including *C. edusa*, *B. euphrosyne*, *E. tithonus*, extra spots, *H. semele*, *A. urticae*, *R. phleas*, *E. jurtina*, *A. coridon*, etc.—Mr. Newman, bred ab. *walkeri* of *Spilosoma menthastræ*; yellow and salmon-coloured *Zygæna filipendulae*; *Z. achillea* from North Britain, etc.—Mr. C. H. Williams, aberrations of *Agriades coridon* and a series of named forms of *A. grossularia*, including ab. *radiata*, ab. *iochaleea*, ab. *lactecolor*, ab. *fulropicta*, ab. *nigrisparsata*, ab. *semilutea*, etc.—Mr. H. O. Wells, two perfect gynandromorphs of *Plebeius aegon* from Berkshire.—Mr. Edwards, exotic Papilios.—Mr. Garrett, *E. jurtina*, with one wing suffused black, and *Oehyria designata* with curiously irregular markings.—Mr. H. J. Turner, a collection of Lepidoptera sent to him from South America, including the Ceratocampid, *Cithe-*

ronia vogleri, with a photograph of its hitherto unknown larva, an unnamed local form of *Propona chromus*, the rare *Protoparce bergi*, several other *Protoparce*, *Attacus maurus*, several species of *Hesperiidae*, *Libythea carinenta*, etc.—Mr. F. W. Frohawk, aberrations of *Vanessa io*; *L. sibylla*, gradation to complete dark suffusion; *D. paphia*, various forms of confluence of spots upper and under sides; *A. cydippe* (*adippe*), partially albinistic, leaden-coloured markings, etc.—Mr. W. J. Kaye, long varied series of *Melitea cinxia* and *M. athalia*, great reduction of dark markings to heavy extension of markings on both upper and under sides.—*Hy. J. TURNER, Hon. Editor of Proceedings.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt St., Liverpool, November 17th, 1919, the President, Mr. R. Wilding, in the Chair.—Mr. H. M. Hallett, F.E.S., of 64, Westbourne Road, Penarth, Glamorgan, was elected a Member of the Society.—Mr. William Mansbridge read a short paper on *Peronea cristana* and *Sarrothripus revayana* in the New Forest. The paper was a description of a few days' holiday at Brockenhurst in pursuit of these variable moths, and was illustrated by the insects captured. Some twenty varieties of *P. cristana* and fifteen of *S. revayana* were exhibited. Mr. Mansbridge also showed a long series of *Bryophila perla* from Wavertree, taken from about 300 yards of red sandstone wall which was only sparsely covered with light grey lichen. The moth was in unusual plenty in August, 1919, and was exceptionally variable. The exhibit comprised bright yellow, orange-mottled forms with the black markings reduced; bright green mottled with darker, the black markings normal; specimens with the usual ochreous ground colour of a greenish-grey: also some with all the markings very much intensified: and finally, a few almost unicolorous, pale ochreous examples. There was no orange-coloured lichen on the wall, neither has any been seen elsewhere in the district. Several members brought their series of *B. perla* for exhibition.—Mr. A. W. Hughes brought an exhibit of Lepidoptera from Palestine and Egypt, and described the difficulty of collecting under service conditions and also of getting the insects safely home.—Mr. S. Gordon Smith showed a fine brick-red variety of *Himera pennaria* from Chester, an apparently wingless female of the same from Delamere and uncommon forms of *Hybernia defoliaria* also from Delamere.—Mr. W. A. Tyerman exhibited bred *Melanthis albicillata* from near Prescott; *Odontopera bidentata* var. *nigra* and typical *Amphidiasys betularia* from Simonswood; *Cilaria immanata* from Prenton and *Eupithecia abbreviata* from Llangollen.—Mr. H. B. Prince exhibited a large number of *Agriades bellargus*, which included abs. *striata*, *arcua* and other forms; also a collection of exotic Sphingidae bred by the Rev. A. Miles Moss in Colombia, S. America.

December 15th, 1919.—Annual Meeting.—Mr. R. Wilding, President, in the Chair. The usual reports were presented and the following were elected as Officers and Council of the Society for the ensuing year, viz.: President: Mr. S. P. Doudney. Vice-Presidents: Messrs. R. Tait, F.E.S., R. Wilding and Dr. G. B. Longstaff, M.A., F.E.S. Hon. Treasurer: Dr. John Cotton. Hon. Librarian: Mr. A. W.

Hughes, Hon. Secretary; William Mansbridge, F.E.S. Council: Messrs. W. A. Tyerman, W. Buckley, Prof. R. Newstead, M.Sc., F.R.S., G. F. Mathew, F.L.S., L. West, M.I.M.E., A. W. Boyd, M.C., M.A., Dr. A. R. Jackson, W. J. Lucas, B.Sc., F.E.S., S. Gordon Smith, Alfred Newstead, F.E.S., Rev. F. M. B. Carr, and E. F. Studd, M.A., F.E.S.—Mr. F. N. Pierce, of Warmington, Oundle, Northants, was elected an Honorary Member of the Society.—The President read an address entitled “Notes from Cartmel Fell.”—WILLIAM MANSBRIDGE, Hon. Secretary.

OBITUARY.

THOMAS RICHARD BILLUPS.

MR. THOMAS RICHARD BILLUPS, whose death was announced in our January issue, was a salesman of garden produce in the Borough Market. Just when he took up the study of entomology we have no precise knowledge, but we find him enrolled as a member of the South London Entomological and Natural History Society in 1877 and his name occurs very frequently in the Proceedings of that Society. He was President for the years 1881, 1888 and 1889. In 1908 his name is absent from the Roll of Membership.

Mr. Billups was elected a Fellow of the Entomological Society in 1879, but retired therefrom in 1901. Under the editorship of the late Mr. John T. Carrington he joined the Reference Committee of the ‘Entomologist’ in 1887 and was a contributor to its pages until 1895, finally resigning in 1900.

As an entomologist he was especially interested in the Coleoptera, but in collaboration with the late Mr. Alfred Beaumont, Hymenoptera, Diptera, Orthoptera and Hemiptera received a large share of his attention, the Hymenoptera chiefly perhaps.

Owing to an enfeebled constitution he was disinclined to follow his entomological pursuits in the early years of the present century, and in 1910 paralysis caused his retirement from active life entirely.

To all who knew him he will be remembered for his kindly disposition, for he was one of those lovers of insects who had no secrets to hide from his fellow-workers. He was ever ready to impart to others any knowledge he himself had patiently acquired.

He leaves a widow, who is an invalid, and a daughter. We understand that his collections and books are to be sent to the Auction Rooms at King Street, Covent Garden, for sale.

We greatly regret to hear of the death of Major R. Bowen Robertson. We hope to give a further notice in the April number.

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APRIL, 1920.

[No. 683

A NOTE ON SOME AFRICAN RHOPALOCERA.

By N. D. RILEY.

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THE following has resulted from the incorporation in the General Collection of the Museum of a selection of specimens from the collection of the late F. C. Selous. The bulk of these were taken during the East African Campaign, but a few appear to belong to collections made during 1911 and 1912 in the Bahr-el-Ghazel and northern British East Africa. The forms here mentioned were almost certainly obtained from the last-mentioned locality.

PIERINÆ.

Teracolus phisadia, Goët., f. *vagus* nov.

♂. Size and markings as in typical *T. phisadia*, except that both wings are almost devoid of basal grey scaling : the black spot at cell-end on fore wing has no pupil ; the basal area of hind wing is uniformly pink and is bordered by a wide black marginal band, the inner edge of which curves evenly and parallel to hind and inner margins.

Most closely allied to the f. *ocellatus*, Butler ('P. Z. S.' 1885, p. 767), with the type of which it has been compared, but readily distinguished by the evenly curved inner edge of hind wing marginal band and the uniformly pink basal area of hind wing.

B.M. Type No. Rh. 046, ♂, labelled "New Moschi, East Africa, March, 1916, F. C. Selous," but probably taken somewhere between L. Baringo and the Lorian Swamp in March, 1912.

ACRÆINÆ.

On examining a short series of an *Acræa* thought to be a form of *A. mirabilis*, Butler, it has been found that under this name Butler confused two species.

1. *Acraea mirabilis*, Butler.

'P. Z. S. Loud.,' 1885, p. 760. ♂.

Butler's description of this, which I have slightly revised from comparison with the type in the British Museum, runs as follows. I give only the male characters :

"Wings above bright tawny with rose-coloured shot (probably rose-red in life) : primaries with extremities of veins black ; with a black spot at end of cell : an oblique sub-apical lighter patch on a black ground : secondaries, owing to their transparency, showing a band just before the middle : outer border with rather narrow, internally wavy black border with a paler central stripe ; head and thorax tawny, the latter sprinkled with whitish scales ; abdomen white. Primaries below soft tawny, with two black discoidal spots ; an oblique oval sub-apical creamy patch edged internally with black ; beyond it and towards the outer margin throughout the veins are black broadly bordered with ash-grey ; secondaries pale yellowish ; basal area spotted with rose-colour ; a black sub-basal transverse dash from costal margin to the cell, and two or three sub-basal black spots ; a narrow whitish suffusion from costa extending into cell followed by an ash-grey subangulated central band, spotted with tawny and rose-red, margined on both sides with black and enclosing a black dash across base of interspace 5 ; veins upon external area black ; the latter has no decided inner edge, but is of a pale buff tint (the ground colour), shading into white internally against the central band : this area encloses a series of internervular pyramidal orange dashes, and is bounded externally by two thin even parallel black lines enclosing a narrow silver-grey marginal band. Fringes white. Body below white, palpi and legs in front buff, sides of pectus spotted with rose-red.

Length of fore wing 1·85 cm.

B.M. Type No. Rh. 047, ♂. Bunder Maria, Somaliland, 27 : iv : '84, Yerbury.

As far as I can ascertain this locality is the Banda Maraya of most modern atlases, situate slightly west of C. Guardafui in Italian Somaliland. Butler expressly states (*d. c.*, p. 756) that the collection came from the Somali coast, *i. e.* from the hot, arid coastal plains, to which true *A. mirabilis* would appear to be confined. No other specimens have reached the Museum since the four males contained in this collection. I have not seen a female of this species.

2. *Acraea miranda*, n. nov.

A. mirabilis, Butler, 'P. Z. S.,' 1885, p. 760, pl. xlviij, fig. 1. ♀.

A. mirabilis, Dixey, 'P. Z. S.,' 1900, p. 11, pl. i, fig. 4. ♂.

A. mirabilis, Eltringham, 'Trans. Ent. Soc. Lond.,' 1912, p. 216 (part).

This, the commoner species by far, hardly needs description. The male is excellently figured by Dixey (*l. c.*), the female by Butler (*l. c.*), whilst Eltringham very accurately describes both sexes and figures the genitalia of the male.

The species may be separated at a glance by the undersides of the hind wings. In *A. miranda* there is a broad, sharply defined whitish band beyond the central band; this is absent in *A. mirabilis*, the buffy marginal area only being separated from the central band, by a diffuse, clear white area broadest in interspaces 4 and 5.

There are numerous other differences. The blackening of the extremities of the veins is much heavier in *A. miranda*; the hind marginal borders of both wings broader; the inner line of border of hind wing underside is formed of a series of crescents in *A. miranda*, whilst it is an even, continuous line in *A. mirabilis*; the black shade beyond the pale sub-apical patch of fore wing is obsolescent in *A. miranda*, and the general coloration richer and darker.

The genitalia of the males are quite distinct. *A. mirabilis* has a long, straight penis and ventral "keel" and a simple uncus; *A. miranda* a sickle-shaped penis, a short ventral "keel" or vinculum and a bifid uncus.

Length of fore wing 2·25 cm.

B.M. Type No. Rh. 048, ♀. "More than 80 miles south of Berbera, Somaliland, Thrupp."

This is Butler's type of *A. mirabilis*, ♀.

The species would appear to belong to the interior plateau and the highlands of Somaliland, whence came Butler's female type and the specimens mentioned by Dixey (*l. c.*). Further south Selous obtained another form of the female.

A. miranda, ♀ - f. *selousi*, nov.

♀. Differs from typical *A. miranda*, female, by being of a general dirty, translucent, pale grey-brown coloration; dark markings as in typical form, but grey, not black. Below, the central transverse band of hind wing broader, and the light band succeeding it pale yellow.

Length of fore wing 2·6 cm.

B.M. Type No. Rh. 049, ♀, labelled "E. Africa, Namanga, 12:ii:16, F. C. Selous," but most probably obtained during February, 1912, between Lake Baringo and Lorian Swamp, British East Africa.

There are three females in the Museum of this form, and three males from same locality, which, however, do not appear to be separable from typical males of *A. miranda*.

RHOPALOCERA FROM EAST TYRONE IN 1919, WITH NOTES ON VARIATION.

BY THOMAS GREER.

In reading over the recent volumes of the 'Entomologist' I notice that few notes from Ireland have appeared, the latest being an interesting account of the butterflies of the Curragh district by the late Col. N. Manders ('Entom.', vol. xlvi (1913), p. 292), so perhaps the following random notes from the north of Ireland will be of interest.

The first butterfly of the year, *Pieris rapae*, was observed on April 18th, followed on the 20th by *Euchloë cardamines* and *Aglais urticae*.

Pieris brassicae, first seen July 14th, was not very common, and only a single emergence was noticed: a large female captured on the heather at Loeah Fea, August 3rd, has the apical blotch and the discal spots united by a suffusion of dark scales. Several of the males of *P. rapae*, 1st gen., were spotless, and many of the females in both broods were of a pale yellow; two of these have the fore-wing spots fused together by dark scales. The spring emergence of *P. napi* was abundant in our damp meadows and swamps, the males varying from a spotless form to well-marked examples with large spot and apical blotch and dashes. Of the females, several nice banded forms occurred, with marginal streak, spots and apical blotch united; two of these are pale primrose yellow: another fine example is entirely suffused with dark scales, except for a small portion of the discal area.

Of the summer emergence many of the males have two spots on the forewings, and in an extreme example the two spots are fused together. The females are even more remarkable than the spring form, the spots and marginal dashes varying through grey, brown, to a deep black, the hind wings on upper side strongly marked with brown or black. I may note here that these extreme forms are to be found more frequently in swamps and damp localities, where the over-wintering pupæ have been submerged off and on during that season.

During May *Euchloë cardamines* was flying in hundreds and several interesting aberrations occurred. Among the males the best was perhaps a beautiful pale yellow example, the lower wings strongly marked with sulphur colour: another with twin discoidal spots on the fore wings: several specimens, with marginal dots on upper wings united to each other and to the apical blotch, give the effect of a dark border to the outer edge of the wings.

A great proportion of the females are of the var. *ochrea*, Tutt,

and the ab. *caulotosticta*, Williams, also was not rare.* On May 22nd my wife found at rest on *Cardamine pratensis* an extreme suffused example of the ab. *radiata*, Williams, and two days later I found, also at rest, a large specimen streaked with orange on both upper and under side of fore wings, the streaks extending from the discoidal spot to the margin.

In working for aberrations one soon gets to know their favourite roosting-places—a sheltered corner in a meadow—a certain clump of *Cardamine* growing in a deep ditch; in such spots, those receiving the rays of the evening sun being the best, numbers of this species are often to be found at rest at sunset, also during dull weather, the food-plants of the species in this locality being *C. pratensis* and *Sisymbrium alliaria*, and I once found ova on *C. amara*, which is a locally common plant in the district. During August *Dryas paphia* was flying in numbers in several mountain glens and I saw a single female on August 23rd in a small wood on the Lough Neagh shore.

Melitaea aurinia was flying in swarms on a heather-clad hill-side on May 21st; it was also common in a damp meadow below where I was on the look-out for *Macroglossa stityus*. The following aberrations have occurred here: *præclara*, *scotica* and *artemis*. Curiously enough the first specimen I ever found in this district was observed at rest on a flower of *Menyanthes trifoliata*, in the middle of an extensive swamp.

On August 23rd, a fine sunny day, I found *Aglais urticae* very numerous at mint flowers on the shores of Lough Neagh; a few *Vanessa io* were also seen. Of five of the latter netted, three were the ab. *cyanosticta*, Raynor. At the end of the month another visit was paid to the lough, when very few *A. urticae* were about, but *Pyrameis atlanta* was observed in some numbers.

Pararge egerides and *P. megæra* were generally abundant; a nice straw-coloured female (2nd gen.) of the latter was captured in August on an old coal-mine dump, as well as several males with additional ocelli.

Aphantopus hyperanthus was very common on grassy banks and in rough meadows.

Owing to the dry season *Epinephele jurtina* was not as plentiful as usual. A fine form occurs locally. In the males the usually slight fulvous area on the fore wings is considerably extended, the females with the fulvous colour occupying the central area of fore wings, and a bright band of the same colour on outer margin of the lower wings, the apical spot often double.

In a locality here the ab. *addenda*, Mousley, was fairly abundant; this as originally described is a female form, but this season I found a number of the male sex, having spots in the fulvous patch, underside. The finest examples of the female

* These are similar to the "aggressive" looking specimen captured by Mr. H. P. Jones near Cambridge ('Entomologist,' vol. li, p. 249).

aberration have eight extra spots on the fore wings, two above and two on the underside on each wing.

Ceonympha tiphon was not scarce in its localities near Lough Fea at 800 ft.; *C. pamphilus* was present on the same ground, frequenting the dryer edges of the bogs. *C. tiphon* was also observed in small numbers in the Lough Neagh district, where it is rapidly being exterminated through drainage and turf-cutting; another local insect likely to share the same fate is *Callophrys rubi* which used to abound on the birch trees growing among the heather: this season I only got two specimens.

Chrysophanus phlaeas fresh on the wing May 20th, the spring emergence being in no way remarkable; on August 20th a field of flax was alive with the summer brood; here I captured some nice aberrations, including a male, left fore wing partly ab. *schmidtii*, right ab. *intermedia*, Tutt, the marginal band on left hind wing ab. *schmidtii*, that on the right *intermedia*; one male ab. *intermedia*; two examples with pear-shaped spots on anterior wings: here also the ab. *cæruleopuncta*, Gerh., was almost as frequent as the type, some of the females especially being very fine.

Our only local blue, *Lycena icarus*, was not abundant, its haunts having been closely grazed for the last few years, and in some of its localities I am afraid it has been exterminated. Amongst a small series captured for a correspondent I was lucky to find a specimen with red marginal spots on upper side of the lower wings: ab. *rufopunctatus*, Neub., another example in bad condition, was netted near Portglenone, Co. Antrim. Here there is only a single emergence extending from the middle of June till September. On the whole the past season was a good one, and although there were a great number of dull, cloudy and windy days, the rainfall was much below the average, and perhaps on this account certain species were more abundant than usual.

Curglasson,
Stewartstown, Co. Tyrone.

RANDOM RECOLLECTIONS OF THE SEASON OF 1919 AT EASTBOURNE.

BY ROBERT ADKIN, F.E.S.

SELDOM have the wet and dry seasons of a year been so sharply defined as they were in this immediate neighbourhood in 1919. The rainfall of the first four months of the year was considerably in excess of the average; on April 28th heavy snow fell, on May 9th a thunder-storm passed along the coast but gave us little more rain than a passing shower, and from that time the weather became distinctly dry and continued so until the end of October, the rainfall for the six weeks from the middle

of May to the end of June being well under half an inch, for the month of July just an inch and a-half, for August an inch and three-quarters, September practically one inch, and October somewhat less, and for the whole period the record of sunshine slightly exceeded the average.

Such conditions one would have expected to be particularly favourable for our butterflies, especially the Vanessids that haunt our gardens in the autumn, yet with some few notable exceptions quite the reverse appears to have been the case. The spring emergence of the "Whites" was well up to the average, but in the autumn, although *Pieris rapæ* was met with in much its usual numbers, and *P. napi*, as will be seen later, was even abundant, *P. brassicæ* was just hereabout exceedingly scarce. This seems to be the more remarkable in view of the reports from Norfolk of its abundance there at the end of August ('Entom.', vol. liii, p. 40), and at Dovercourt, Essex, earlier in the month ('Entom.', vol. lii, p. 227).

Cyaniris argiolus is with us a common garden species and occurs all along the sea front, the spring emergence usually far outnumbering that of the autumn. In 1919 this order of things was reversed, the autumn emergence apparently being much the greater and indeed more numerous than usual.

Agriades bellargus and *A. corydon*, both abundant species in their special haunts along the cliffs, were less so than usual, and in one isolated spot, where the first-named species may usually be seen by the score, it was hard to find more than two or three individuals even on the most suitable of mornings. The autumn Vanessids, too, were quite scarce. Often *Pyrameis atlanta* may be seen jostling one another for a seat on their favourite Michaelmas daisies, but not so last autumn; the flower-heads of *Sedum spectabile*, beloved of *Aglais uritæ*, were seldom tenanted by that species, and the great patches of "red valerian" on the banks of the parade seemed to have lost their charm, so seldom were either of these species, or that ubiquitous creature *Pyrameis cardui* seen at them; all three species were met with, but in far smaller numbers than for many seasons past. One *Vanessa io* was seen.

But if some species have been unduly scarce some others have by their abundance quite made up for them, as will be seen from the following incidents, and in passing I may mention that *Argynnis aglaja* was met with much more commonly in its headlong flight along the hollows on the Downs than for many years, and that *Macroglossa stellatarum* has been exceptionally frequent, cropping up in all sorts of places and at all hours of the day from early morning till late evening, from mid June till late September, and on two separate occasions during the last-named month single specimens of *Colias edusa* were seen flying over the parades.

On July 16th I had occasion to visit the woods around Hailsham. It was an exceptionally fine afternoon, and on entering a ride in the woods, right down which the sun was shining with its full force, I found *Dryas paphia* and *Limenitis sibylla* flying in profusion; the ground was very slightly damp from a light shower that had fallen the day before, and both species were dividing their attentions between the bramble blossoms and the damp ground, *L. sibylla* resting on the path so thickly in some places that it was difficult to walk there without treading on them. I had no net, but it was easy work to fill what few pill-boxes I had in my pocket with a sample of the two species picked up from the path with my fingers; unfortunately they were all more or less chipped. Here, too, *Pieris napi* was very common, but they seemed to confine their attentions to the bramble blossoms; many *Aphantopus hyperanthus* were seen and *Epinephele ianira* was abundant.

September 18th was a brilliant morning, and on a walk along the parade about 9 a.m. (G.M.T.) I noticed several specimens of *Tortrix pronubana* flitting about, sometimes singly, at others two or three or half-a-dozen in a bunch, but on reaching a particularly well-sheltered spot backed by an ivy-covered bit of wall perhaps a hundred yards in length, and receiving the direct rays of the morning sun, they were flying in the utmost profusion. There were certainly hundreds of them on the wing at the time, and the bright sunlight on their brilliant orange-coloured hind wings as they pursued their curious zig-zag flight was a sight not easily to be forgotten. They appeared to be all males, the females having a much heavier and less jumpy flight. On passing the same spot later in the morning not one was on the wing; their flight for the day was over.

Eastbourne:

February, 1920.

FIVE NEW STEPHANIDE IN THE BRITISH MUSEUM.

By E. A. ELLIOTT, F.Z.S., F.E.S.

Diastephannus sulcatus, sp. nov.

Face irregularly rugose, vertex and occiput trans-striate, with very distinct longitudinal sulcus, three stout curved carinae between the posterior ocelli, temples smooth, posterior margin of head bordered. Scape longer than cheeks, second flagellar joint twice as long as first, third as long as first and second together. Neck of pronotum finely trans-striate, semiannular smooth in front, basally arecuate striate; mesonotum rugose, scutellum laterally strongly punctate; metanotum longitudinally carinate; propleurae smooth, mesopleurae finely trans-striate, apically punctate; median

segment and metapleuræ cribrate punctate, the former with an elongate triangular central basal space, punctate and extremely finely trans-striate and dull, bounded by large punctures. Petiole trans-striate, shorter than the remaining smooth segments. Terebra shorter than body, black, spicula pale red. Hind coxae trans-striate, their femora glabrous, bidentate, tibiae compressed to middle. Wings hyaline.

Black; head red, apices of tubercles and the carinæ on vertex black, scape and first flagellar joint rufo-testaceous, second joint darker red, apically black; anterior tibiae and all tarsi rufescent. Femoral teeth white.

Length 13 mm.; abdomen $7\frac{1}{2}$ mm.; petiole $3\frac{1}{2}$ mm.; terebra 11 mm.

Hab.—Luang Prabang, Indo-China, September 29th, 1917 (R. V. de Salvaza).

The sculpture of the median segment resembles that of *Icucodontus*, Schlett., which the author describes as "basally and centrally smooth," and agrees also in the colour of the head and the femoral teeth. It differs in the sculpture of the head and prothorax and in the entirely black terebral sheaths.

Diastephanus quadridens, sp. nov.

♀. Frons strongly arcuate rugose, vertex and occiput strongly trans-striate and sulcate, three straight carinæ between the posterior ocelli, temples smooth, ocellar space rugose, posterior margin of head bordered. Scape about as long as cheeks, second flagellar joint one and a half times as long as first, third as long as first and second together. Prothorax coarsely trans-striate, basally more finely and the extreme base smooth; mesonotum trans-rugose, marginal punctures of scutellum deep; propleurae finely striate, mesopleurae punctate above, smooth beneath; median segment and metapleuræ cribrate punctate. Petiole finely trans-striate, as long as the remaining smooth segments. Terebra longer than body, black. Hind coxae and femora densely and finely trans-striate, the latter bidentate, but the two prominences on the basal half are so unusually developed as almost to be called teeth, tibiae compressed to middle. Wings hyaline.

Black; head and two basal joints of antennæ rufo-testaceous vertex nigrescent.

Length 15 mm.; abdomen 10 mm.; petiole 5 mm.; terebra 17 mm.

Hab.—Luang Prabang, Indo-China, October 5th, 1917 (R. V. de Salvaza).

This species is characterised by the unusual development of the femoral teeth and by the sculpture of the mesopleurae, hind coxae and femora.

Diastephanus trilineatus, n. sp.

♀. Frons and vertex very finely arcuate striate, occiput trans-striate, posterior margin of head bordered, carinæ between the

posterior ocelli subobsolete. Scape as long as cheeks, second flagellar joint half as long again as first, third as long as first and second together. Pronotum trans-striate, mesonotum diffusely punctate, scutellum smooth, propleura smooth, mesopleurae finely striate and punctate; median segment and metapleurae cibrate punctate. Petiole trans-striate, apically smooth, as long as remainder of abdomen, which is smooth. Terebra shorter than body, with subapical white band. Hind coxae trans-striate, their femora smooth and bidentate, tibiae compressed to slightly beyond middle.

Black; mouth parts, inner and lower orbits, frons centrally and two basal joints of antennae flavous; vertex and occiput nigro-rufescent; legs more or less rufescent.

Length 9-13 mm.; abdomen 5-8 mm.; petiole $2\frac{1}{2}$ -4 mm.; terebra $8\frac{1}{2}$ -12 mm.

Hab.—Hoabinh, Tonkin, August, 1918 (R. V. de Salvaza).

The dimensions are those of two specimens in the British Museum, differing in size only. The colouring of this species is exactly as in *D. bilineatus*, Elliott, from which it differs in the bidentate femora with unicolorous teeth.

Dastephanus simillimus, sp. nov.

♂. Head extremely finely trans-striate, second flagellar joint fully twice as long as first, third about as long as first and second together. Neck of prothorax rather finely trans-striate, semiannular smooth; mesonotum punctate, mesopleurae smooth above, punctate beneath; median segment and metapleurae cibrate punctate. Petiole very finely trans-striate, slightly longer than the remaining smooth segments. Terebra much shorter than body, black. Hind coxae trans-striate, femora smooth, bidentate, tibiae compressed to middle. Wings hyaline.

Black; the front of the head is coloured exactly as in *trilineatus*, Elliott; anterior tarsi pale.

Length $12\frac{1}{2}$ mm.; abdomen $7\frac{1}{2}$ mm.; petiole 4 mm.; terebra 9 mm.

Hab.—Hoabinh, Tonkin, August, 1918 (R. V. de Salvaza).

This species bears a strong resemblance to *trilineatus*, but is easily distinguished by the longer second flagellar joint and by the entirely black terebral sheaths.

Dastephanus trilobatus, sp. nov.

♂. Frons and vertex extremely finely, occiput more coarsely trans-striate, posterior margin of head very finely bordered. Scape slightly longer than cheeks, first and second joints of flagellum of equal length, third about as long as first and second together. Pronotum transverse, apically coarsely, basally more finely, the extreme base smooth; mesonotum and scutellum smooth with a few coarse punctures, mesopleurae smooth above, punctate beneath; median segment coarsely and irregularly, metapleurae cibrate punctate. Petiole shorter than rest of abdomen, finely trans-striate remaining segments smooth. Terebra very slightly longer than

body, its sheaths black. Hind coxae basally punctate, the remainder, trans-striate, femora bidentate, tibiae compressed to beyond middle. Wings hyaline.

Black; head beneath, inner orbits and frons flavous; the upper margin of the colour is trilobed, the central narrow streak extending to the top of the lower tubercle, the outer lobes triangular; antennæ basally rufo-testaceous, posterior metatarsi white.

Length 11 mm.; abdomen 7 mm.; petiole 3 mm.; terebra $11\frac{1}{2}$ mm.

Hab.—Hoabinh, Tonkin, August, 1918 (R. V. de Salvaza).

Differs from *D. trilineatus*, Elliott, in the shorter second flagellar joint, the sculpture of the mesonotum and mesopleurae, the absence of the white band on the terebra and the colour of the face. In *D. trilineatus* and *simillimus* two descending rufescant streaks divide the space between the eyes into five strips of colour of about equal breadth, and the lower tubercle is entirely black: in the present species the outer streaks are broadly triangular and the flavous colour extends to the top of the lower tubercle. The three species are undoubtedly very closely related.

41, Chapel Park Road,
St. Leonard's-on-Sea;
December 29th, 1919.

COLLECTING FUNGUS-GNATS.

BY CLAUDE MORLEY, F.Z.S., etc.

THE best means of gauging the progress made in British entomology is a comparison of the present status of any given group with that it occupied at some definite former period. As a very small chap I had a great ambition, as most kiddies have, to know the name of everything I saw, and was most annoyed with my nursery governess because she would persist in calling a tiny thing one could hardly see but was most obviously circular "a beetle," and great fat things half the size of one's finger and of the same shape, "a beetle." They could not both be beetles, I maintained, because she herself had to admit they were different! But I had no knowledge in those pristine days of how little the greybeards themselves knew of such matters, or what the hiatus *valde deflendus* would be ere one came to discover the name of each of these and other insects. This was way back in the seventies, in the days of woolly-bears and wood-lice, and now, forty years later, some progress really is apparent. It is slow, disappointingly slow, which we must lay at the door of spasmodicity. All, or nearly all progress is owing to individual effort, which is to say that a man becomes obsessed by an enthusiasm for a certain group, and works like a Trojan,

with the result that that group emerges from his hands in a new and scintillating garb of comparative finality. He has collected all its specimens in his vicinity and perhaps elsewhere, worked them systematically and published a monograph; the result will be of infinite value, and the infinity of the value will be in direct ratio to the man's ability. Forty years ago not a dozen people in England knew a Mycetophilid when they saw it; now there are a fair number of Dipterists, and they all know it; there are quite a lot of general entomologists, and they, for the most part, know it in a vague way; I myself know it much in the way that I know a glacial man's skull from that of a cave tiger.

Nothing more exact is claimed for me, and I owe the names of all my recent captures in this delightful family of fungus-gnats to Mr. F. W. Edwards, who has been so good as to look them through and tell me what they are. Without names, natural objects appeal to nothing but our aesthetic taste; with them, the world of their habits, economy, differentiation and utility is at once thrown wide. This door Mr. Edwards has opened and I propose to see what is beyond it, and thence, all ignorant of literature upon the subject, to bring something new in the way of distribution and methods of collecting these beauteous little flies. That they do feed in fungi I suppose one must take for granted as known since De Geer's time; yet it seems curious that I, who may claim a pretty messy experience with Boleti and Agaries through a decade of beetle-collecting, have never had the least experience of the fact. Nor have I yet succeeded in discovering the imagines' *modus vivendi*: the most prolific hunting-ground seems to be the windows of one's own house, if it be a country one; and the second best to be the luscious flower-tables of umbelliferous plants near woods.

The most satisfactory point about the Mycetophilid study is the limited number of British species: no more than 150 were known to occur here with any degree of certainty in 1900, and during the last score of years this number, though naturally augmented by later investigation, has not increased to an alarming extent. This is doubtless due to the fact that most of the species are of such size and so brightly coloured that they attracted the attention of Curtis and our early entomologists, who duly placed upon record those that were then described.

Of the first subfamily, the Sciarinae, little can be said here because its members are the smallest, dullest and most inconspicuous of the whole group. *Sciaura Thomas*, a black gnat with black wings, is very common upon all kinds of flowers; it is an autumn species, and I have found it from July 7th, 1897, to September 25th all over Suffolk and throughout the New Forest; it seems ubiquitous and frequently occurs in

cop. On the contrary, *S. carbonaria* appears in the early spring; I found it flying in an Ipswich garden on April 29th, 1895. Another kind, probably *S. fluripes*, Pz., was taken in Wangford Wood near Southwold on September 18th, 1913; but the remainder must be omitted for lack of names: they are often common among *Caltha palustris* about May 10th, on bracken in woods during September, on *Heracleum* flowers in July, and on house windows in June: on May 21st, 1910, there were quantities among the aphid, *Drepanosiphum phalanoides*, whose sweet secretion they licked up with avidity on maple in my garden here; and the same year I found species at Louisburg in Co. Mayo. I do not think that the majority feed in fungi, but simply in decaying wood. On January 22nd, 1898, several larvae were found in rotten poplar at Bentley (all localities are in Suffolk unless noted), from whose puparia both sexes emerged on May 10th following, and the male is in the British Museum, from a willow-stump, brought into my study on April 10th, 1907, one *Sciara* emerged on the 13th of the following month, and on 20th three more were out and a pair of them at once copulated; on February 14th, 1904, a foot-long rotten oak branch was brought home from a Wherstead fir wood, from which there emerged on June 9th next hundreds of *Sciara* in both sexes.

The majority of the Mycetophilinæ are common insects, but of the genus *Cordyla* I have met with only two species, by sweeping at Letheringham Wood on August 15th, 1918, and on windows of this house on August 11th, 1919. *Dynatosoma fuscicorne* is a lovely black-and-white gnat, which occurred on the windows of this house on August 26th, 1917. *Mycetophila punctata*, Mg., now called *M. jungorum*, De G., certainly hibernates, since I have discovered it in a bag of ground-refuse brought home on February 14th, 1904, from Wherstead; it seems to first come abroad on April 16th, when I beat it from *Pinus sylvestris* in 1897; it seems to disappear after May 17th until the middle of July, and is then abroad till September 18th, when I took it in 1912 on Southwold pier. *M. lineola* is even more a winter species, probably more familiar to Coleopterists than Dipterists; on December 13th, 1899, it was gaily flitting about my bedroom window in Ipswich, though snow covered the ground: it occurred in the Wherstead bag with the last species in February; in Bentley Woods on February 4th, 1900, it was not rare, while exactly a month later I found it in the utmost profusion there by beating *Picea excelsa*; singly at Bramford in April and Westleton in July. *M. bimaculata* has only occurred to me in March—on 3rd by beating fir at Bentley in 1899, on 4th by beating *Picea* there the next year, and on 16th there five years earlier. *M. cingulum* is found on these house-windows towards the end of October till November 30th,

and again in the middle of April at Bentley. In a peculiarly marshy wood near the Suffolk coast at Blythburgh a great variety of Mycetophilidae were found on birch bushes September 14th, 1912; and among them a couple of *M. guttata*, Dz., which was on a Southwold window on September 10th, 1919; *M. dimidiata* appears on the Monks Soham windows about May 22nd, and at Setley in the New Forest was another species on July 12th, 1909.

Close to the sea at Southwold a fair number of *Trichonta submaculata*, Staeg., were on the panes of a beach-shelter at 6.15 p.m. on September 19th, 1913; and I took one that Mr. Edwards considers a new species at Monks Soham on August 18th, 1917, now in the British Museum. *Rhymosia fuscata* is among the most abundant kinds on the windows here from the end of October to that of November (I have just taken it sitting quiescently on an outhouse wall, November 24th, 1919); but *R. domestica* has only occurred to me in a peculiarly sylvan spot on Crow Wood Hill near Nottingham on August 9th, 1914. *Erechia festiva*, Winn., and *E. crucigera*, Lun., also appear on these windows in the late autumn; both *E. tririttata*, Staeg., and *E. fungorum* occurred in the above damp wood at Blythburgh; *E. parva*, Lun., I beat from birch bushes on September 9th, 1915, in Tuddenham Fen; and somewhat doubtful *E. guttiventris* were captured at Cromer in Norfolk during August, 1903, and at Washbrook on March 27th, 1897. *Allodia lugens*, Wied., was swept at Westleton on September 19th, 1912. Two rather doubtful *A. caudata*, Winn., were in a beach-shelter at Southwold on 25th of the following September; the pretty little *A. amena*, Winn., beaten from *Pinus sylvestris* at Potters Bridge there five days earlier; and another species occurs on Monks Soham windows during mid-May.

The species of Mycothera and Brachycampta have hitherto eluded me, though Verrall found several in this county. *Docosia valida*, on the contrary, is abundant, quietly sitting on the trunks of large oak trees in Bentley Woods early in May, and also on those of Palmer's Heath at Brandon late in the month. *D. sciarina* was swept from *Mercurialis perennis* on May 4th, 1901, at Coddenham. My only *D. (Megophthalmidia) crassicornis* was sucking the stylopods of *Angelica sylvestris* on September 1st, 1903, at Harkstead, near King Harold Godwinesson's hunting estate. *Zygomyia validula* is abundant on Monks Soham windows from August to November, and I took it at Cromer in Norfolk in 1903 during the former month; *Z. notata* also was at the windows here on August 21st, 1919. The handsome orange *Glaphyroptera*, now called *Leiomyia*, species are always abundant on *Heracleum sphondylium* flowers in the summer. *G. fascipennis* thus occurred at Peterborough in Northants on June 14th, 1908, at Foxhall on September 10th, 1903, on thistle flowers in the Orford salt-

marshes on July 7th, 1919, and on *Chærophylloides sylvestre* at Claydon on June 16th, 1903; and a species, probably *G. cylindrica*, Winn., abounded at Staverton Thicks a few miles away during the preceding August; *G. subfasciatus*, the very distinct *G. winthemi* and a fifth species, frequent the windows at Monks Soham during June, August and September.

Anaclinia nemoralis I have only beaten from mountain-ash in Bentley Woods on May 29th, 1902, and swept at Market Rasen in Lincolnshire on 11th of that month in 1912. *Boletina basalis* was also swept at Bentley on May 13th, 1900; and on June 17th, 1907, I was so fortunate as to take *B. dispesta*, Dz., on bracken in the New Forest, Wilverley Inclosure, which specimen alone represents the species in the British Museum. The large and handsome *Leptomorphus Walkeri* is surely rare, for it has occurred to me only on July 22nd, 1904, at Cutler's Wood in Freston. *Lasiosoma hirtum* occurs on the windows here in July and August, as well as in May; *Sciophila (Mycomyia) marginata* appears there in June, and in the Bentley Woods from April 11th to May 20th sometimes on fir branches. *S. fasciata* was on "The Elms" windows at Ryde in the Isle of Wight on March 16th, 1898; *S. incisurata* in the above Blythburgh Wood; *M. lucorum* in Staverton Thicks on September 7th, 1916; and other species occur on these windows in August and early October.

The Ceroplatinæ are doubtless the most abundant group as regards specimens; and *Asindulum rostratum*, Ztt., abounds on tables of *Sphondylium* in my orchard here throughout July, frequently in cop. or hovering in little clouds close to the flowers. The large black *A. nigrum*, Latr., was long mistaken for *Platyura atrata* by Dr. Meade; and Piffard thought it *P. inticta* of Schiner; I met with a good many examples on July 12th, 1900, only, on both *Angelica* and *Heracleum* flowers in marshes at Henstead and Kessingland. Of the genus *Platyura*, the large *P. marginata* was found at Setley and Burley in the New Forest on *Erica tetralix* during June and July, as well as on reeds by the Orwell at Ipswich on June 1st, 1897. *P. atrata* was sitting on the road at Bilsthorpe on July 30th, 1898, but *P. semirufa* is not rare in August and September on umbelliferous flowers at Lyndhurst and Matley in New Forest, at Crow Wood Hill near Notts., at Chippenham Fen in Cambs., and in Suffolk at Easton Broad, Monks Soham, Tuddenham Fen, Staverton and South Cove. *P. flava* occurred at Grovely Wood near Salisbury on June 27th, 1911, with a doubtful specimen beaten from oak at Staverton on June 14th, 1904; *P. fasciata* was found at Crouch Hill near London on June 11th, 1907, and on August 15th, 1913, I took one flying in a garden hut at Monks Soham, exactly like *Culex pipiens*. *P. nemoralis* is common on windows here from the end of May to July 23rd; also I have found it among plantains in the lawns and at Tannington sitting on the sawn end of timber.

P. atricanda is rare among the *A. rostratum* at *Heracleum*; *P. zonata*, Ztt., is on these windows early in July, but is much rarer than *P. unicolor*, which delights in the hottest weather, and of another species (?) nov. I took a specimen on July 6th, 1919. *Odontomyia flaripes*, Pz., seems quite a late thing, whereof I swept one from nettles and saw others close by on dilapidated *Heracleum* flowers on October 27th, 1903, only, at Wherstead.

Both species of *Ceroplatus* have fallen to my net: *C. lineatus* was considered doubtfully British till eight or ten flew about a dead willow trunk, full of *Stigmus Solskyi*, in my garden on June 6th, 1911; one had been taken here on 16th of the preceding August ('Ent. Mo. Mag.', 1912, p. 264). *C. tipuloides* was first beaten from oak in Staverton Thicks—all really ancient forest—on June 24th, 1903, and subsequently was taken sitting on the wall of a Monks Soham outhouse on August 16th, 1910.

The distinctively long-horned Maerocerinae are well represented in Suffolk, where *Macrocera lutea* have been captured at Barton Mills, Mildenhall and Tuddenham by beating birch and *Pinus sylvestris* from June 3rd to 21st only. The pretty little *M. phalerata* is not uncommon at Gosfield in Essex (how Piffard and I hunted for its name twenty years ago!), and Tuddenham in marshes, at Staverton on oak, and at Monks Soham on cypress and windows; my dates are from June 14th to August 27th. *M. centralis* is from Perry Wood in the New Forest on June 14th, 1911; and there at Matley Bog on July 7th, 1909, I took another species, probably new and now in the British Museum. *M. fasciata* is not rare on the windows here and very handsome when alive, from May 29th to October 17th, from 8 a.m. to dusk at 7.30 p.m.; also I found both sexes at Killarney in June, 1913, but *M. stigma* is the commonest of the genus on my windows and in a glass fly-trap in the paddock; here it has occurred annually for the past ten years between May 27th and July 9th only, sometimes as early as 8 a.m., though it can hardly be generally a common species, since elsewhere it has turned up only at Killaloe in Tipperary, where I took a female on June 16th, 1913, in a shady lane at Wherstead on the same day in 1904, and on oak at Staverton two days earlier.

In the same Blythburgh Wood, *Bolitophila glabrata*, Lw., was found on September 14th, 1912, and my only *Diadocidia ferruginea* was taken on the dining-room window at Monks Soham on September 14th, 1917. I was a day or two too late to secure a good series of *Myctobia pallidipes* on June 9th, 1900; then bat a single specimen was left yet sitting at the base of a very large white poplar (felled the next year), by the side of a lot of its empty puparia, which were protruding from exuding sap, at Town Street in Brandon. This circumstance seemed to me conclusive evidence that the larvae had fed upon the moist wood fibre; and I am of the opinion that it will be found the majority of

Mycetophilidae have similar habits : that their larvæ live mainly in the cambian layer, between the bark and timber of rotting trees and their fallen limbs.

In my "Diptera of Suffolk" ("Trans. Norf. Nat. Soc.", 1915, Suppl., p. 180), 213 species of *Mycetophilidae* are ascribed to Britain, whereof 59 are recorded from Norfolk, 95 from Suffolk, and 119 from the two counties combined ; this paper adds 15 species to the Suffolk list, bringing its total to 110 different kinds, and *Exechia guttirentris* to the Norfolk list, making its total 60.

Monks Sahom House,
Suffolk.

NOTES AND OBSERVATIONS.

THE SYDNEY WEBB COLLECTION.—What's in a name? Shakespeare tells us that a rose by any other name would smell as sweet. Yet we doubt whether the large number of historic specimens that were sold at Stevens' Auction Rooms on March 9th, when the fourth and concluding portion of the Sydney Webb Collection was disposed of, would have fetched anything like the prices that they did had they not had that name behind them. It is an interesting scientific fact that an insect not usually occurring in this country should occasionally find its way here, and one that is worthy of being duly put on record when it happens ; yet it is open to doubt whether the value of such specimens is thereby so greatly increased. But the prices paid seemed to indicate that more than one would-be possessor of them considered that it is so. Thus, *Leucania extranea* made £8; *Luperina dumerilii* £7 10s.; *Agrotis flammatra* £10 10s.; *Harmodia (Dianthæcia) compta* £6 10s.; *Miselia bimaculosa* £4 5s.; *Polia zincenii (lambda)* £10 and £5 10s.; two *Hadena peregrina*, included in a lot of sundries, £6; *Catephia alchymista* £9 9s.; and *Pseudophia (Ophiodes) lunaris* £5 10s. and £10 10s. Nor were the other rarities and "extinct" species, when in good order and well authenticated, less eagerly sought after, but not otherwise. Two *Synia musculosa* brought 25s. and 27s. 6d. each, while others sold in lots with sundry other species made only from 5s. to 10s. per lot. *Crymodes exulis* of the Scottish mainland form in lots of two realised £6, £3, and £3 per lot, but for similar lots of the Shetland form 20s. and 12s. per lot was paid. Males of *Hydrilla palustris* sold singly made from 25s. to 32s. 6d., and females 30s. to 52s. 6d. Twenty *Noctua subrosea*, of which several were quite good specimens, sold from £10 down to 16s. 3d. apiece. Seven *Cerastis erythrocephala* in one lot ran up to £9, but eight in a lot with other things made only 45s. A lot which included a varied series of *Epunda lutulenta* and a "very white var." of *Miselia oxyacanthæ* brought £4, and one consisting of nine *Heliothis armigera* and twenty *H. peltigera* £4 5s. *Xylina furcifera (conformis)*, put up in lots of three, made from 40s. to 60s. per lot, the two best *Catocala fraxini* 60s., and two others not quite so good 35s. The long series of *Chrysophanus dispar* were distributed over three of the sales, and those reserved for this one were not the worst of them. Two streaked varieties ran up to £16 and £12 each respectively ;

males went at from £12 10s. to £5 10s., females £11 to £5 10s., undersides £7 10s. and £4, and a "pupa case" £4. The historic series of the *Eudoreæ*, contained in three cabinet drawers, was offered in one lot and made £12 10s., while the no less famous series of *Peronaea cristana*, which occupied two whole drawers and contained the type-specimens of several of the named forms, ran up to £38 before falling into hands where we are glad to know that it is likely to be of real scientific value. Many other lots of the small fry also made good prices—a healthy sign as showing that those too often neglected groups have still some interest for the more intelligent workers. The few books included in the sale went irregularly; a lot consisting of two copies of 'Stanton's Manual,' the one interleaved with F. Bond's notes and the other Webb's own copy, also with his notes, sold for 65s., and 'Barrett's Lepidoptera,' large paper edition with coloured plates, made £26. Cabinets appeared to be less eagerly sought than they were a year or two ago, a really good forty-drawer making £44, and a forty-four £48. The total of the day's sale exceeded £800, thus bringing the total realised for the whole collection with its appurtenances to within a few pounds of £3000—an amount, we believe, well in excess of anything previously obtained for any private entomological collection at public auction.—R. A.

NOTES ON *PARARGE MEGERA* AND *P. EGERIA*.—As an indication of the remarkable forwardness of the season it may be of interest to note that on the 17th and 18th inst. I beat eight full-grown larvae of *Pararge megera*. A few of these had already hung themselves up for pupation on the 19th. I have on three different occasions bred interesting forms of *Pararge egeria* by forcing the larvae, which usually hibernate. Of three larvae thus reared, 1903-1904, one emerged a variety. In 1905-1906 I repeated the experiment with better success, obtaining eight well-marked forms out of eighteen pupæ. This last winter a repetition of the conditions resulted in further varieties. I do not give the number as all the imagines have not yet emerged. The varieties bred are of three forms: (1) Upper side—some of the central spots are missing. Under side, fore wings—middle discoidal cell-spot much intensified. Hind wings nearly uniform in tint, with almost all transverse markings absent and the marginal dark shade much intensified to a dark purplish tint. (2) A general lightening of the ground tint of the upper side to a pale greyish-brown. (3) A smudging of most of the pale spots on the upper side and obliteration of the apical eye-spot.—E. D. MORGAN; "Freedon Cottage," 27, Sanford Crescent, Chelston, Torquay, February 20th, 1920.

SCARCITY OF *AGLAIS URTICÆ*.—When reading the interesting notes of Mr. Rowland-Brown and others on the above subject, it must have occurred to many how much entomological knowledge is lost through scattered and imperfect statistics and observations. Such partial statistics are very apt to lead us to erroneous conclusions. Surely the time has come for better methods? The number of lepidopterists has increased so rapidly that if the country was divided into 150 or 200 divisions there could certainly be found at least one collector in each district willing to aid any organised effort

to increase entomological knowledge by record-keeping. Such volunteers ought easily to be found through the various entomological societies. Sufficient knowledge to identify the species is all that would be necessary, so that beginners would be welcome. I would venture to suggest that the experiment be confined at first to the Rhopalocera and afterwards extended. Each volunteer could be supplied with a form on which to enter his particulars under headings such as "name of species," "date of first capture," "place found, whether woodland, marsh, moor, downs, mountain, etc.," "nature of soil, whether chalk, clay, etc.," "whether abundant, common, scarce or rare," "other observations." The volunteers should send in their forms at the close of the season, together with a type pair of each common species (wild caught, not bred), to an appointed secretary to tabulate and summarise. The results could be published annually either in the form of a special supplement to the 'Entomologist,' or as a cheap pamphlet. It is important that the secretary should be an enthusiastic, energetic and experienced lepidopterist of high standing, and I would venture to suggest the name of Mr. Rowland-Brown if that gentleman would accept the post. I should be quite willing to volunteer my services for the south coast of the Isle of Wight for 1920.—ERNEST CORNELL; Burmah, Newport Road, Ventnor, January 8th, 1920.

NOTES ON THE EARLY GEOMETRIDÆ.—The appearance of the early spring Geometers has been erratic this year at Windermere. By January 14th *Phigalia pedaria* was quite common on the electric lamps and *Hybernia leucophæria* and *H. marginaria* were just beginning. A very fine example of the "black" form of *P. pedaria* was taken. One noteworthy point this year with regard to both *H. marginaria* and *H. leucophæria* was the large proportion of dwarf specimens, some of the former species being no bigger than odd fine examples of *Cheimatobia brumata* in my collection. Perhaps the abnormal heat here in the latter half of May last year was accountable for the premature pupation of the larvae. I have noticed the same tendency when larvæ have been "forced" at high temperatures. On February 5th the first *Anisopteryx escularia* was observed—an early date for this part of the world; whilst on the same night the earliest examples of *Hybernia rupicapraria* appeared—an insect we are accustomed to look for about mid-January. The extreme form (var. *fuscata*) of *Hybernia marginaria* is fairly common at Kendall (eight miles away), but apparently absent from Windermere, though occasional specimens with a leaning towards melanism do occur at the latter place. This is curious, for other species—*Phigalia pedaria*, *Gonodontis bidentata* (var. *nigra*), *Hybernia leucophæria* and *Himera pennaria* are more strongly melanic at Windermere than at Kendal. In the latter locality we have no recorded capture of a black male *P. pedaria*, although black females predominate.—FRANK LITTLEWOOD; 22, Highgate, Kendal, February 16th, 1920.

THE WINTER MOTHS.—I was interested to read the note of your correspondent, Mr. H. D. Ford (*antea*, p. 67), re the above, and in answer to his query I can inform him that his observation as to the prevalence of females over males in most of these moths is quite usual. This at first sight may not appear so to those who search for

the imagines in their natural haunts, as the males, being winged, are more readily seen and captured, but in breeding them I have invariably found such to be the case. Of the following species, all of which (except the last) have apterous females, I have had considerable numbers under my observation at various times over a number of years, mostly from larvae collected during the previous summers, and have invariably found female emergences preponderating: *Hybernia rupicapraria*, *H. leucophoaria*, *H. aurantiaria*, *H. marginaria*, *H. defoliaria*, *A. aescularia* and *P. pedaria*. Of *A. hispidaria* and *N. zonaria* I have had no experience, and cannot therefore say if this character is general with them or not. Strangely enough, in the case of *L. hirtaria*, in which species the female is winged, of two batches reared by me the emergences were nearly equal. Last June, being in the neighbourhood of West Runton, Norfolk, I found the trees in many places entirely defoliated by countless hordes of caterpillars. They hung from the trees in festoons, and covered them and the hedges for several miles: it would be no exaggeration to say there were millions. The trees attacked were oak, birch, hazel, sycamore, whitethorn, also bramble and honeysuckle, and in a lesser degree ash and sweet chestnut. There were five species at work, and I collected about twelve of each, *defoliaria* and *pedaria* being apparently the most numerous. From these larvae imagines emerged as follows: *H. leucophoaria*, 3 ♂, 7 ♀; *H. marginaria*, 3 ♂, 5 ♀; *H. defoliaria*, 2 ♂, 8 ♀; *A. aescularia*, 2 ♂, 7 ♀; *P. pedaria*, 1 ♂, 9 ♀. The theory of protection to the species by this arrangement of greater safety to the female (through her apterous condition) during the stormy and inclement weather general in the early months of the year is ingenious and taking, but when it is remembered that there are other moths abroad at this time of the year whose females are not apterous, and that there are some females that are so among summer-emerging species, the correctness of the reasoning may be questioned, and room is given for further research and speculation as to whether this is or is not the true answer to the riddle.—J. E. CAMPBELL-TAYLOR; March 6th, 1920.

THE "WINTER" MOTHS.—In reply to Mr. H. D. Ford ('Entom., March, 1920, p. 67), in my experience the females of the "winter moths" and of *Phigalia pedaria* are always quite as plentiful, and very often much more numerous, than the males. One evening in the second week of last June I beat out in Lepton Wood, near here, a quantity of full-fed larvae of Hybernids and *Phigalia pedaria*, and this winter have bred fifty-eight *P. pedaria*—twenty-eight males and thirty-five females. I did not keep count of the other species, but in the considerable number of *Hybernia aurantiaria* which emerged a considerable majority were females. Of *H. defoliaria* I only bred six or eight specimens, about half being of each sex. Thus far the males of *H. marginaria* largely predominate, but as they are still emerging it is possible the females may appear later. But my more immediate object in writing this note is to ask if it has been observed in other parts of the country that the specimens of these moths are this winter much below the average in size? None of the males of the *P. pedaria*, *H. aurantiaria* or *H. marginaria* are of

ordinary size, most of them considerably below, and some only about half what they ought to be. It can scarcely be that the larvæ were starved, as although some of the trees were fairly well stripped, there was still sufficient foliage on all the trees I beat to have fed up all the larvæ on them and a good many more. I may add that all the *H. marginaria* I have bred or seen are melanic and so are also most of the *P. pedaria*.—GEO. T. PORRITT; Elm Lea, Dalton, Huddersfield, March 12th, 1920.

CACCECIA UNIFASCIANA, DUP.—Mr. Sheldon's article on the larva of this species has helped to solve a little problem that has puzzled me for years, viz. how and where does it feed up in the spring? He quotes Spuler to the effect that it then feeds partly on *withered* leaves. I think Spuler is quite right, because although the imago is often excessively abundant one never or "hardly ever" finds the larva. I certainly have bred three or four from pupæ in spun-together privet leaves, but excepting on one occasion a search for the larva in the spring has always proved futile. Early in April, 1894, when examining one of those birds'-nest-like formations on a hornbeam tree in the forest at Woodford, I noticed a number of small larvæ amongst the accumulated dead leaves, etc., in the dense mass of twigs; thinking they might be *P. glaucinalis*, which has often been found in similar formations on birch trees, I brought it home and placed it in a cardboard hat-box. Looking in the box a fortnight later I noticed the larvæ still amongst the rubbish but they did not appear to have increased in size. Upon looking in again in June I was astonished at the sight of six *unifasciana*, and others emerged to the number of thirty-one all told. Now if these larvæ fed at all after I brought them home they *must* have fed on the dead leaves amongst the twigs because there was nothing else for them to eat! Perhaps if we searched amongst the dead leaves we might find them more commonly. On the other hand, they may be strictly nocturnal, retiring to the dead leaves at dawn as Mr. Sheldon's appear to have done. I alluded to the matter in 'Entom.', vol. xxxv, p. 130. In 'Stainton's Manual' privet is given as the food-plant, and to this I find I have added "whitethorn," doubtless with good reason, but I cannot remember when this pabulum was added. I have seen it flying in great numbers at dusk over whitethorn where there was certainly no privet growing near.—A. THURNALL; Wanstead, Essex, March 8th, 1920.

PERONEA RUFANA DOES HIBERNATE IN THE IMAGO STAGE.—In the 'Entomologist' for 1919, p. 172, I question whether this species hibernates as an imago, and state that "so far as I am aware no one has seen a specimen after hibernation." Clearly I had overlooked a communication to this magazine by Mr. F. C. Whittle, vol. lii, p. 54, in which he observes that he obtained imagines of this species in the spring of 1918 at Camghouran. Since the publication of my paper I have heard from two correspondents, Mr. J. Gardiner, of Hartlepool, and Mr. T. Ashton Lofthouse, of Middlesbrough. Both these gentlemen inform me they have observed *P. rufana* after hibernation. Mr. Lofthouse says: "I have a specimen, apparently a male, which was taken by myself on March 30th, 1907." Mr. Gardiner writes:

"Some thirty years ago, when searching in early spring for larvae of *Bombyx rubi* on our sandhills amongst *Rosa spinosissima*, I noticed several *P. rufana* flying about the plants in bright sunshine." Mr. Gardiner adds that neither *Myrica gale* nor *Salix* sps. were near, and suggests that the larvae fed upon *R. spinosissima*. I do not know whether it has ever been found upon this plant, but as so many of the genus are pretty general feeders it would not be surprising.

W. G. SHELDON; March 1st, 1920.

THE MULLEIN SHARK.—Weismann ('Evolution Theory,' vol. i, p. 121), writing of the mullein, says that owing to the thick hairy felt on its leaves these are "spared by grazing animals, but they have smaller enemies, like the caterpillars of the genus *Cucullia*, which, however, never completely destroy them, but only eat large holes in their leaves." The statement is evidently not altogether true. During the summer the year before last I kept some fifty of the larvae of *C. verbasci* in confinement, and invariably they one and all ate the mullein leaves clean from apex to base and margin to midrib. And that they eat after identically the same fashion in a state of nature the plants on the railway bank, whence I obtained my captures, fully testified: their leaves were just as wholly and cleanly devoured.—J. W. WILLIAMS, M.R.C.S., etc.; Bewdley, Worcestershire.

PYRAMEIS ATALANTA IN FEBRUARY.—On Sunday last at about mid-day a *Pyrameis atalanta* was seen by me sunning itself in the garden. This is worth recording, as a few years ago a suggestion was raised that it did not hibernate in this country.—(Miss) K. M. HINCILIFF; Worlington House, Instow, N. Devon, February 24th, 1920.

EARLY APPEARANCE OF PHEOSIA (NOTODONTA) DICTEOIDES.—I was surprised to find that a specimen of the above had emerged in one of my breeding-cages which had been kept during the winter in my dressing-room, which had no fire, on February 25th. A second specimen emerged on March 5th.—(Rev.) J. E. TARBAT; Fareham, Hants.

ABNORMAL (?) APPEARANCE OF CARADRINA QUADRIPUNCTATA.—On the evening of February 29th this year a freshly emerged specimen of *Caradrina quadripunctata* flew into the sitting-room window of my friend, Mr. J. Smith, attracted by the light. South notes the species as occurring sometimes in May, but usually associated with the months of July and August. With the weather so abnormally mild as has been the case this winter, anything, apparently, may happen! Continuing my previous note on the early spring moths in this district, it may be of interest to mention *Xylocampa areola* at electric light (Windermere) on February 18th, together with *Malenydris multistrigaria* and *Tentocampa stabilis*. On the 22nd two melanic *Phigalia pedaria* in a wood quite close to Kendal, the first a good black, the true ab. *monacharia*, the other of similar pattern, but with the smoky parts and wing-rays brown rather than black.—FRANK LITTLEWOOD; 22, Highgate, Kendal.

GRYLLUS DOMESTICUS, LINN.—Examining recently a box of Orthoptera from the Cambridge University Museum I found (Mr. H.

Scott having called my attention to it) a specimen of the house-cricket (*Gryllus domesticus*) which had malformed maxillary palpi, that on the right having the distal segment double, while the left one had the same segment hollow at the end. The specimen, a female, was taken in a manure-heap at Kew on September 5th, 1917. There is an idea prevalent that the house-cricket is becoming less common. Have any of our readers noticed this?—W. J. LUCAS.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—January 8th, 1920.—Mr. S. Edwards, F.L.S., President, in the Chair.—Messrs. T. H. Grosvenor, of Redhill, F. W. Cocks, of Reading, O. R. Goodman and A. de B. Goodman, of Goswell Road, H. L. Gauntlett, of Putney, R. Swift and H. Garrett, of Bexley, were elected members.—Mr. Lister exhibited his local races of *Plebeius aegon* and gave an account of his observations on the mosses of Witherslack, where the race *masseyi* is the dominant form.—Local series and special forms of the same species were exhibited by Messrs. Buxton, Mera, Newman, Sperring, B. S. Williams, A. E. Tonge and Swift. A discussion ensued. The problem was, What are the causes which produce the *masseyi* form and make it dominant in the small area at Witherslack?—A further considerable number of species from the Digby collection of *Tinea* about to be placed in the Society's cabinet were exhibited.—Mr. Tonge, an underside of *Ruralis betulae* with a curious perfect circle beside the normal narrow silvery band.—Mr. Moore, the very rare *Papilio nobilis* from E. Africa.—Mr. Dunster, the cranium of a skate.—Mr. Bennett read notes on, and showed photographs of, the act of pupation in the *Nymphalidae*.—H. J. TURNER, *Hon. Editor of Proceedings*.

S.W. YORKSHIRE ENTOMOLOGICAL SOCIETY.—The eighteenth annual general meeting of this Society was held at Shelley on January 10th, 1920, Mr. B. Morley, President, in the Chair.—The President and other officers were re-elected. The following new members were elected; Dr. W. J. Fordham, F.E.S., Sheffield; Messrs. F. Hooper, Middlestown; A. H. Lodge, Normanton; G. T. Porritt, F.L.S., F.E.S., Huddersfield; Ashley Smith, Elland; and H. Spencer, Elland.—Among the exhibits were: Mr. Morley: Long and varied series of *Hybernia defoliaria* and *H. aurantiaria*; interesting series of locally taken *Acalla variegana*, *Tortrix forskaleana*, *T. conwayana* and local specimens of *Olethreutes salicella* and *Gypsonoma neglectana*.—Mr. T. H. Fisher: Second-brood specimens of *Arctia caja*, variations of *Chrysophanus phleas*, local specimens of *Incurvaria tenuicornis*, *Gelechia longicornis*, *C. scalella* and *Cerostoma sequella*.—Mr. J. Hooper: Dark forms of *Cosmia affinis* and variations of *Hybernia leucophæaria* and other Hybernids.—Mr. D. H. Harrison: a living *Vespa vulgaris* ♀ taken in the open early in January.—Dr. H. D. Smart: A few locally taken insects of orders other than Lepidoptera, including the rare Dipteron, *Xylophagus ater*, *Chironomus dorsalis*, *C. dispar*, *C. plumosus* and *Tanypus varius*, the last our species being new to the county.—H. D. S.

OBITUARY.

R. BOWEN ROBERTSON, 1860-1919.

IT would seem that Major Robertson first began to take up entomology about 1887, when he was living at Hartley Wintney, near Winchester, for he had then a very small collection and confined himself to Lepidoptera. Not only, however, was the locality in which he was living one of the best in England for a collector of that Order of insects, but Major Robertson was able to get the run of the Bramshill estate, which is specially good for some species, and, being strictly closed to the public, was practically an untouched hunting-ground. He was also free to devote his whole time to the pursuit, with the exception of a short period of training each year with the Militia, and even then, being near Swansea in another good district, he was able to give some attention to insects.

Being a very quick and indefatigable observer little escaped his eye or his net, and though later on his activity was much impaired by an accident which rendered him somewhat of a cripple for life, he still struggled about undauntedly after his prey, while his powers of observation remained as keen as ever.

A few years later he left Hartley Wintney for Pokesdown, near Bournemouth, where he was able to find the extremely local British dragonfly, *Orygastra curtisii*, Dale, while he and his daughter Nellie re-discovered the Giant Earwig, *Labidura riparia*, Pallas. It was at this time that he commenced to make a collection of dragonflies, while later on he extended his researches to the sawflies and other insects. After some years he left Pokesdown and removed to Chandler's Ford, where he was residing at the time of his death. His insects, which by his wish are to be sold at Stevens' Auction Rooms, are particularly well set.

Although lame, during the war he rejoined the army as a Second Lieutenant in the Royal Defence Corps, but on demobilisation he recommenced in 1919 his old pursuit, appearing to be quite well and not nearly so lame as heretofore. That he did not entirely forsake entomology even during the war is evidenced by the list of captures (published in the 'Entomologist') which he made at Oare Camp, near Faversham, where he was stationed.

Major Robertson was a whole-hearted, keenly-observant, and most successful entomologist, a pleasant companion, and a faithful friend. The entomological world is the poorer for his loss, and especially so are those who were reckoned amongst his personal associates.

W. J. L.

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[No. 684

A NEW ARHOPALA (*LEP: LYCÆNIDÆ*) FROM CEYLON.

By N. D. RILEY, F.E.S.

In a small collection of Lycaenidæ recently received from Mr. W. Ormiston from Ceylon there is, amongst other interesting forms, a pair of an *Arhopala* which Mr. Ormiston considered new. After a fairly careful search I have been unable to find any published description with which it agrees and have therefore come to the same conclusion. In such a well-worked country as Ceylon one would hardly have expected such a distinctive species of this showy genus to have been overlooked so long. Its discovery therefore may, I hope, be taken as an earnest of many more yet to be made known.

Arhopala ormistoni, sp. nov.

Arhopala, sp. nov., Ormiston, "Notes on Ceylon Butterflies," pt. i, p. 58, in 'Spolia Zeylanica,' 1918.

♂. *Upper side*.—Both wings uniformly deep rich violet-blue. *Fore wing* with costa and hind margin narrowly black, widest at apex; *hind wing* with costa and inner margin broadly, hind margin narrowly, dark brown.

Underside.—*Fore wing*—ground colour light grey-brown with a faint vinous tinge, areas 1a, 1b and 2 centrally and for greater part very pale shiny grey-brown, cell and remainder of wing surface thickly sprinkled with grey; a small circular spot near base of cell, a larger oval spot in centre, and a still larger one at end of cell, all much darker brown and ringed with white; a discal band of six similar subquadrate spots, interrupted at vein 4, the lowest (in area 1b) very indistinct; a similar oblong spot at base of area 2 lying along vein 2, and an indistinct oblong pale-brown mark in 1b just before base of vein 2 and in line with central cell spot. A submarginal row of brown lunules edged both sides with whitish, largest and most distinct posteriorly. There are indications of two small costal spots, similar to the cell spots, in areas 9 and 10. *Hind wing*—ground colour similar, but, together with the markings, almost entirely obscured by very heavy ashy-grey scaling. The most distinct markings are the three small dark brown white-ringed basal spots in the cell and areas 1c and 7, the larger one in centre of cell, the triangular one in centre of 7, and the two squarish ones in 6 and 7—these last being the

uppermost spots of the discal band. The remainder of the discal band is represented very obscurely by the outer edges of the spots only, forming a very much broken wavy semicircular row of short curved dark lines. There is the outline of a long oval spot across cell end, and indications of three or four small spots between it and the inner margin. A small black spot is present at the anal angle, and another just to side of base of tail in area 2, both bordered proximally with metallic blue scaling, which is also present marginally in two small patches between these spots.

Head dark brown with a small white spot between the antennae; the eyes, except dorsally, ringed with white; palpi white, the third joint and half the second dorsally and laterally only, brown. Thorax, above, covered with longish bronze-green hairs; below, white. Body dark brown, ventrally pale-buffish.

Both wings above uniformly dark smoky brown, with no trace of blue or bluish reflections. Otherwise exactly similar to the ♂.

Length of fore wing, ♂ 2·0 cm., ♀ 1·9 cm.

B.M. Types No. Rh. 061 (♂) and 062 (♀) from Nakiadeniya, 16 miles from Galle, S. Ceylon, iv, 17, W. Ormiston.

Several other specimens in Coll. Ormiston.

This species seems to be nearest to *A. aliteus*, Hew., and *A. mirabella*, Doherty, but it can at once be separated from any Indian *Arhopala* known to me by its ashy-grey underside and plain brown female.

Natural History Museum,
South Kensington;
March 12th, 1920.

A CHALCID PARASITE OF *ENDOMYCHUS COCCINEUS*, LINN.

BY C. T. GIMINGHAM, F.I.C., F.E.S.

In view of the comparatively few records of Hymenopterous parasites of Coleoptera, the following notes may be of interest.

On June 3rd, 1919, in a wood at Long Ashton, near Bristol, I came across a small mass of rather dry and shrivelled fungus at the base of a dead beech-tree, in which were crowded considerable numbers of the pupæ of a beetle, afterwards found to be *Endomychus coccineus*. These pupæ were a strikingly bright pink colour, with white limbs and black eyes, the whole body being covered with short, stout hairs, each with a glistening white knob at the end. There were two mushroom-shaped cerci at the apex of the abdomen, to which, in many cases, the black shrivelled remnants of the larval skin were attached. The average size was 6 mm. long and 3·5 mm. broad.

A portion of the fungus, containing about sixty of these pupæ,

was brought home, and on June 16th one was noticed just becoming adult. The elytra were then of a very beautiful pearly shell-pink colour with no trace of spots, the thorax and abdomen a deep salmon-pink with almost an orange tint and the legs and antennæ brown. Later in the evening the posterior spots on the elytra were faintly indicated by darker areas, and by the next morning all four dark spots were well marked, the ground-colour of the elytra remaining pink, while the thorax had deepened somewhat in colour. During the following days many more specimens became adult, though the final deep red colour of the elytra only developed very slowly, and it was not until July 3rd that the majority had assumed the typical appearance of *Endomychus coccineus*. During this period and for some long time afterwards the beetles showed no disposition to leave the fungus.

When first taken all the pupæ were alike in appearance so far as was observed, but about June 16th it was noticed that in a number of cases development was apparently not proceeding normally. Some of the pupæ had turned dark brown, the outer skin becoming harder and more chitinous and the abdomen completely changing in shape, becoming curiously elongated, narrower and cylindrical. Parasitism was suspected and these brown pupæ were isolated and kept under observation.

No further change was observed until July 11th (some days after all the healthy pupæ had become adult), when one or two were found to have small round holes in the back and a number of Chalcids were found in the box. On making a hole in another from which the parasites had not yet emerged, six of the parasites immediately crawled out and hopped about apparently fully developed. There was still a good deal of fluid in this pupa case. The flies were packed in the anterior two-thirds. During the next few days the parasites emerged from the remaining pupæ, and of ten cases in which the number of flies hatching from a single pupa was noted, eight produced 5 ♀ ♀ and 1 ♂ each (the ♂ much smaller than the ♀ ♀), one produced 6 ♀ ♀ and 1 ♂, and one 5 ♀ ♀ only. Of the total number of 65 pupæ originally taken, 25 became adult beetles, 26 were known to be parasitised and the remainder died or were killed at an early stage.

With regard to the identity of the Chalcid, the following reference to a parasite of *Endomychus coccineus*, which occurs in Curtis' description of this beetle ('British Entomology,' vol. ii, p. 570), is of interest: "Neither Latreille nor any author that I can remember has characterised the larvæ of *Endomychus*, and having found a considerable number. . . . I shall proceed to their description and history. In pulling the bark off the decayed stump of a fir-tree I saw some larvæ apparently entangled in a white cottony web, which I at first thought were

young glow-worms. On removing them I discovered that they were of various sizes; they moved slowly and some of the largest seemed as if they were either dead or in a torpid state, but these proved to have been punctured by a little parasite allied to *Gnatho dispar* (Colax, pl. 166), a great number of which afterwards hatched. The larvae were of a dead deep chocolate colour, but ferruginous beneath. . . . In three weeks some of these larvae became pupæ of a deep ochreous colour, but they soon died."

The *Colax dispar* figured on Pl. 166, 'British Entomology,' vol. iii, is not, however, identical with the Chalcid now observed (this is confirmed by Mr. Box), and it was not possible to discover in the present case whether parasitism actually took place before or after pupation. The passage quoted above does not, unfortunately, make it clear how the identity of the larvae was established, and although the description "pupæ of a deep ochreous colour" might do for parasitised *Endomychus* pupæ, it could not possibly refer to healthy ones. Westwood ('Mod. Class. Insects,' vol. i, p. 394) mentions the observations of Curtis, and Walker published a short description ('Ent. Mag.,' 1836, p. 496) of the parasite from Curtis' MS., naming it *Pteromalus Endomychi* (see also Elliott and Morley in 'Trans. Ent. Soc.,' 1907, p. 12, and 1911, p. 456). There is also a description of a Chalcid parasite from an *Endomychus* sp., in a paper on "Parasitic Hymenoptera" by Ashmead ('Trans. Amer. Ent. Soc.,' 1896, p. 227), to which Mr. Claude Morley kindly referred me. This species, described as *Endomychobius flaripes*, sp. n., from "one ♂ and six ♀ specimens bred from the supposed larva of *Endomychus bignuttatus*, Say," from Columbia, is, however, evidently not the same as the present insect.

Mr. Morley, who examined my specimens, is of opinion that they are undoubtedly the same species as that described by Walker as *Pteromalus Endomychi*. The description, however, does not apply to Curtis's figure of *Colax dispar*, which is unquestionably a different insect. Walker states that his description is from a male specimen, but Mr. L. A. Box kindly tells me he considers that it really refers to the female. He says, *in litt.*: "The ♂ has the antennæ shorter and entirely fulvous. In the ♀ the abdomen is almost circular and in colour as described by Walker. In the ♂ the abdomen is narrower, the sides being parallel, and æneous or dark except the base, which is fulvous."

In view of the interest attaching to this confirmation of an old record, it would seem worth re-publishing Walker's original description,* with one or two notes by Mr. Box.

"Sp. 163. *Pteromalus endomychi* (Curtis MSS.). Mas:

* Walker, 'Ent. Mag.,' 1836, p. 496.

Aeneus, antennæ nigro-fuscæ, abdomen basi fulvum, pedes fulvi, alæ limpidae. Corpus crassum, latum; caput thorace paullo latius; antennæ subfiliformes, corporis dimidio longiores; articuli 5_o ad 10 mm. breves, cyathiformes, subæquales; clava longi-ovata, articulo 10_o angustior et plus duplo longior; thorax ovatus; prothorax brevissimus; mesothoraxis parapsidum suturæ vix conspicuæ; metathorax brevis; abdomen rhombiforme, thorace brevius, segmentum 1 mm. maximum; sequentia brevisima; alæ sat latæ; nervus cubitalis radiali multo brevior.

"Aeneus; oculi rufo-picei*; antennæ nigro-fuscæ; articuli 1us et 2us fulvit; abdomen fulvum, nitens, apice æneum; pedes fulvi; coxae æneæ; meso- et metatarsi flavi, apice fusci; alæ limpidae; squamalæ et nevoi fulva, stigma obscurius, minutum.

(Corp. long. lin. 1; alar. lin. 1½.)"

AN UNDESCRIPTED SPECIES OF PTYCHOPTERA FROM WEST AFRICA (PTYCHOPTERIDÆ, DIPTERA).

BY CHARLES P. ALEXANDER, PH.D., URBANA, ILLINOIS.

THE very extensive collections of African crane-flies belonging to the British Museum (Natural History) were sent to me for study through the kindness of Mr. F. W. Edwards, custodian of the Nematocerous Diptera. A new species of *Ptychoptera* that is described herewith was included in this material. The crane-flies of this collection will be described and keyed in a monographic revision of the Ethiopian Tipuloidea that the writer has in preparation. I wish to thank Mr. Edwards very sincerely for the privilege of studying this unrivalled collection of tropical African crane-flies.

Ptychoptera africana, sp. n.

Antennæ with the basal segments yellow, the distal segments dark brown; head blue-black; mesonotal præscutum shiny metallic blue; pleura light reddish-yellow; wings with the costal margin, the broad apex and a narrow seam along the cord dark brown; abdomen shiny black, the tergites with two narrow yellow rings on the third and fourth segments.

Female.—Length about 9 mm.; wing, 7·8 mm.

Rostrum dark brown; palpi with the basal two segments dull yellow, the terminal segments dark brown. Antennæ with the basal segments dull yellow, on the sixth and succeeding segments passing into dark brown; basal half of the second scapal segment dark brown. Head shiny blue-black, the front more opaque, the vertex surrounding the antennal fossæ indistinctly reddish.

Pronotum pale yellow. Mesonotal præscutum shiny metallic blue-black, the humeral angles broadly but indistinctly reddish;

* The ocelli are amber coloured.

† Also third and fourth.

scutum, scutellum and median area of the postnotum deep black. Pleura and lateral regions of the postnotum light reddish-yellow. Halteres dark brown, the base of the stem paler. Legs with the coxae and trochanters yellow; femora dark brown with the bases yellowish, these broadest on the fore legs, where they occupy almost the basal half, on the hind legs very narrow; tibiae and tarsi dark brown. Wings subhyaline, the costal margin, the broad wing-apex and a narrow seam along the cord dark brown; the costal margin includes cells *C* and *Sc* and the bases of cells *R* and *M*; the wing-apex includes all of cells *R* 4 and *M* 2, the inner margin of this area being almost straight, continued obliquely backward from the end of *Sc*; the seam along the cord is broadest anteriorly, narrowed to a point at the bend of *Cu* 2; the outer margin of cell *Cu* 1 is narrowly darkened; veins dark brown. Venation: *Rs* short, almost straight, longer than *r-m*, *R* 2 + 3 and *R* 4 + 5 arising directly from the end of *Rs*. The macrotrichiae in the distal cells are found in most of the area distad of the cord in cells 2nd *M* and *Cu* 1 and along the wing-margin in cell *Cu*.

Abdomen with the basal tergite yellow, the remaining tergites shiny black with a narrow yellow ring on the third and another at the base of the fourth segment; last two segments and the valves of the ovipositor pale brown.

Habitat.—Southern Nigeria.

Holotype, ♀, Ilesha, September 17th, 1911, caught in house, 8.30 a.m. (Capt. L. E. H. Humfrey).

Type in the collection of the British Museum (Natural History).

Ptychoptera africana is the second species to be described from the Ethiopian region, the other being *P. capensis*, Alexander, of Natal ('Annals South African Museum,' xvii, pt. 2, pp. 139, 140, 1917). By the author's key to the species of *Ptychoptera* ('Canadian Entomologist,' xlvi, pp. 197, 198, 1913) the present form would run out at couplet 4. It more or less resembles *P. distincta*, Brunetti, of India, in the dark costal margin and wing-apex, but is readily told by the yellow thoracic pleura and other characters.

BUTTERFLIES IN MACEDONIA.

BY HERBERT MACE.

(Concluded from p. 64.)

Pyrameis atlanta.—I never saw anything of this butterfly until the autumn of 1917, when I was sent to a post in a deserted village which had only been evacuated in the spring of that year. Almost every garden was haunted by one or more Red Admirals sailing to and fro in the fearless friendly way one associates with this insect. I saw it at intervals down to the beginning of

December, when it presumably went into hibernation, although the weather was still mild and open. It appeared again in March fairly freely, and although I left the village soon afterwards I used to visit there occasionally and often saw *atalanta* flying round the gardens. Comparison with home specimens reveals no important variation, but the red appears much more crimson than in British specimens.

P. cardui.—The most abundant of all butterflies in Macedonia, thronging everywhere, from the tops of the highest hills to the seashore. At times it seemed incredibly numerous. In the autumn of 1918, just before I left Janes, I found hundreds congregated round a barley-stack in the middle of the plain one evening. I presumed they were merely going to roost, but the numbers settled on the stack and flying around were uncountable. I was amused one day by four of these insects, which were fighting most furiously for quite a long time, dashing at each other and often sending an opponent headlong to the ground. It seemed to be quite a free fight and not the ordinary rivalry for a female, such as is often seen among other species.

Pararge megæra.—A moderately common insect from April to October, haunting roadsides exactly as at home. All the specimens I examined were of the variety *Lyssa* with grey hind wings, and compared with British specimens there are two other differences worth noting. One is that the subsidiary eye near the large one at the tip, which in the type is often a mere tiny spot, is in the variety quite definite and clearly pupilled, both above and below. The eyes on the hind wings beneath are also larger and more distinct than in the type.

Cœonympha pamphilus.—An abundant species from April to November. All my specimens are of the variety *Lyllus*. They are larger than the type, the apical spot is more distinct, and there is a submarginal row of small spots on the hind wings.

Hipparchia briseis.—This fine butterfly, though not unduly common, was occasionally seen in June and again in autumn. I found it only in the roughest and stoniest hollows and ravines and its powerful flight made it difficult to capture, although it seldom went far away and continually returned and settled on the same spot.

Epinephele lycaon.—It is quite possible that I overlooked this species, the male being extremely like *jurtina*, and I have only one specimen, a very worn female, taken near Lake Doiran in September.

E. jurtina.—A very abundant insect from May to September, the 15th of the former month being the earliest date on which I noticed it.

In a ravine near Janes I encountered a number of curious forms of this species. All were considerably darker than British specimens, especially the males, but many exhibited more or less

albinism, particularly round the outer margin of the hind wings. In conjunction with this there was a great deal of distortion, the affected wings often being shortened or crumpled, and one which I noticed to be flying awkwardly was found to be entirely destitute of the left hind wing.

Melanargia larissa was the only species of this genus that I secured, although I occasionally saw Marbled Whites in the neighbourhood of the Spanc River near Kukut at the end of May. Probably they were all of this species, for their flight was considerably stronger than that of the British *galatea*. This specimen is larger than mentioned by Kirby, measuring 63 mm., and it is darker, having a broad, almost unbroken submarginal black band.

Thecla acaciae.—The Hair-streaks are very local, and one might live in a locality for years and never find a species, which might nevertheless occur regularly and freely in one restricted spot. So it is not surprising that I only encountered two species.

Acaciae I found in fresh condition flying round large clumps of a fine species of vetch under a rough hedge near Kukus in the last week in May.

Callophrys rabi.—I found one specimen in a ravine near Irikli in April.

Chrysophanus thersamon.—This very handsome little butterfly was exceedingly abundant on Janes plain, but elsewhere I only met two isolated specimens, one near Kasimli in July and the other at Yenikeuy on the Ardjan river in August. At Janes it was abundant from the end of August throughout September, 1917. In 1918 the first brood appeared the first week in May and continued throughout June, after which only a few isolated specimens were met with until the end of August, when it again appeared abundantly. Its flight is somewhat different to *phleas*, being shorter and rather more rapid. It was addicted to the blossoms of *Polygonum rumicis* and heliotrope—the latter a plant which is abundant in the district on newly-turned land and is very attractive to numerous small species of Lepidoptera. It was charming to see several pairs of *thersamon* flying round and settling upon this plant, the intense colour of their wings forming a striking contrast to the white of the flowers. I took several specimens of the var. *omphale*, which are distinctly smaller, expanding only 27–30 mm. The ground-colour is rather more yellowish than in the type, and the spots above are larger while beneath they are distinctly smaller. The tails are longer and more slender.

'*C. phleas*'.—Proved very interesting in some respects, the specimens I obtained being strikingly different to British forms. One solitary specimen approaches the British type, but in this the spots on the fore wings are larger. The vast majority of specimens were darker than the darkest British forms I have

seen, the whole of the upper surface, except the marginal band, being suffused with greenish-black. In size they slightly exceed British specimens and the tails at the outer angle are long and prominent. So far from being found in open country, in Macedonia I usually saw it in narrow ravines and brambly passages between rocks, where I often saw scores flying together. I met it from the last week in March to the last in November at intervals.

Tarucus telicanus was the most interesting of the Blues in the Balkans. Though extremely common where it occurred it was confined exclusively to ravines which have a perennial stream and remained in the vicinity of its food-plant, the purple loosestrife, round which there were often scores to be seen at a time. It is very inconspicuous and flies very swiftly, so that it would not have been an easy matter to secure specimens had not they been very numerous. I do not know another Blue which is so elusive. July was the earliest month in which I observed this species and it continue to be more or less common down to October.

P. argus (œgon) was common in June and July in open fields flying round *Polygonum rumicis*.

Aricia medon.—Common in ravines near Janes in April and May. The local form is rather smaller than British *medon*, the red spots are brighter, more uniform in size, and extend quite to the costa of forewings both above and beneath. The pupils of the eyes are also much larger than in British specimens.

P. icarus.—Abundant in the usual habitats of this species from April to September. One afternoon I observed a most extraordinary congregation of thousands in a dark cave-like opening in a ravine near Janes. Variation much as usual with this species, but I have no blue females among my specimens, all being uniformly brown. One female has basal bars on the fore wings, and a rather boldly marked male is remarkable for having only one hind wing marked with the triangular white patch generally found in this species.

Glaucopsyche cyllarus.—I only saw three specimens of this species, at Irakli in April, 1917, and Janes in May, 1918, and do not think it is common. It flies in bare rocky places, and in general appearance and habits the females remind one of *C. minimus*, though much larger than that species.

Celastrina argiolus. Common in ravines where ivy grows, from April to August. My specimens have the spots beneath very much smaller than in British ones.

Carcharodus alceæ.—The commonest Skipper in the parts I visited, flying freely over the open plains and visiting thistles, Centaureas and similar plants. I also saw a good many flying with *T. telicanus* at the loosestrife. On the wing in July and August.

C. altheæ.—Not so common as the last, but of similar habits. I have a note of its appearance in April.

Hesperia sile.—One specimen only, taken in a ravine near Janes on May 19th, 1918.

H. malvae.—Common on hillsides in April and May. My Macedonians are much blacker than British and the submarginal band of the hind wings is very indistinct. This is a very variable species which appears to merge imperceptibly into its allies, and it is doubtful whether some of them are distinct.

Pyrgus orbifer, which I thought at the time of capture were dark *malvae*, chiefly differs by the spots being smaller, less rectangular and more evenly distributed on both wings, while the large spots on the hind wings beneath approach spherical rather than angular form. It is on the wing a little later than *malvae*, but frequents similar situations.

Adopora flava.—Common in ravines at Janes and Kukus as early as May and not long on the wing. There is a decided difference between the Macedonian and British forms. All the former are larger, the average being about 33 mm., and in general the colouring is brighter orange. I have one of each sex with greenish-black margins. The underside is more uniformly orange fulvous than in British specimens and I have one outstanding example in which the underside of all the wings is unicolorous orange fulvous.

Fairettes, Harlow.

A SUPPLEMENTARY NOTE ON THE BUTTERFLIES OF SOUTH MACEDONIA.

By H. ROWLAND-BROWN, M.A., F.E.S.

If only as a record of the lepidopterists who hunted and observed during the weary years of waiting and preparation on the Macedonian front from 1916 to 1918, the lists of butterflies published from time to time in the pages of the 'Entomologist' deserve to be made as complete as possible. Our first paper on the subject was put together from the ample notes furnished by Mr., now Captain, Barraud, "Notes on Lepidoptera observed in Macedonia, 1916, 1917" ('Entom.', 1918, vol. li, pp. 59-63, 86-88). After he had been home on leave early in 1918, I supplemented the species already noted with one or two which had escaped his identification (*ibid.*, p. 112), and Mr. Barraud himself added a list of the "Geometridæ in South Macedonia, 1917" (*ibid.*, pp. 145-6). Last year there followed "Notes on the Lepidoptera of Macedonia," by Mr. F. Norton and Mr. J. E. Delbanty (*ibid.*, vol. lii, pp. 139-141); and a supplementary note by Mr. H. V. Wilson (*ibid.*, p. 166); and Mr. Mace has

now concluded his interesting observations on the subject in our pages.

Before Capt. Barraud broke up his collections, he very kindly presented to me a number of his captures, including some of those of 1917-1918 which I had not seen before, and further, the Natural History Museum has been enriched by two collections for the most part made in localities other than those visited by Capt. Barraud, whose first-hand knowledge of the continental forms served him in good stead.

The Museum Collections were made by Mr. B. Blanchard and Mr. R. W. D. Barney, B.Sc., respectively (referred to as the "Museum Collections"), and I owe it to the courtesy of Mr. N. V. Riley, the Curator of the Butterflies at South Kensington, that I am in a position to extend still further the list of South Macedonian Rhopalocera with the following species or forms of species not hitherto recorded.

Hesperia fritillum (= *cirsii*, Rbr.).—Kopriva, 9 : v : '19. *Pyrgus tessellum*.—This Skipper turns up from two localities, Ferezei, 10 : vi : '17, and Paprat, 2 : vi : '18. Compared with the Hungarian form, it is an immense insect and probably is referable to var. *gigas*, Brem.* It is therefore somewhat remarkable that Capt. Barraud did not find it at Paprat when he was there. *Gegenes nostrodamus*. Feragli, 10 : vi : '17.

Chrysophanus thetis, Klug.—Capt. Barraud wrote me when he sent his notes that he thought he had encountered this beautiful species, but he appears to have confused it with *C. thersamon*. I find, however, in the "Museum Collections" a male *thetis* from Ormonti, 10 : v : '17. [*C. dispar rutilus* ('Entom.', lii, p. 166).—Specimens from Kopriva, 1917. It seems fairly common in suitable localities throughout S. Macedonia.] *C. ottomanus*.—Another copper not in Capt. Barraud's list; Kopriva, 22 : iv : '17: and apparently must have been well distributed by the numerous examples in the boxes. *C. alciphron*.—Very large females almost uniformly without light coppery ground-colour. I consider that this form is the *intermedia* of Steffanelli. It bears little resemblance to the type, and none whatever to *gordius*.

Langia telicanus.—Kopriva. *Tarucus balkanica*.—From various localities. *Polyommatus icarus*.—I have a number of this species which superficially appear much more like *P. candalus*; they are very small (= ? var. *minor*, Ckll.), and the underside markings are reduced to mere pin-points in some examples. *P. meleager*.—Hill 778; both forms of the female, type, and *stevensi*, Tr. *P. amandus*.—From Kopriva and many other localities, apparently wide-spread, and not sporadic as in its western limits in France. *P. anteros*.—Paprat, 7 : vi : '18.

Parnassius mnemosyne.—A series from Paprat, 8 : vi : '18.

* Given specific rank by M. Mabille in Seitz's 'Lepidoptera of the World.'

Euchloë gruneri.—A single male in beautiful condition was sent to me by Capt. Barraud with label, "Salonica, April 5th, 1916." This is, no doubt, the butterfly suggested by him as *E. euphenoides* ('Entom.', li. p. 63).

Olias edusa heleicina, Obthr.—Kopriva, 6:v:17.

Issoria lathonia.—I have from Capt. Barraud an aberration of the female taken on the Hedja Tepe at 3000 ft., which appears to be undescribed. Unfortunately the hind wings are in rags. It is melanic. All the black spots on the upper side are enlarged, especially the three basal spots nearest the costal margin of the fore wings, and they are coalescent. It must have been a superb example when fresh.

Melitaea phoebe aetheria.—Examples of this form in all the collections, e.g. from Kopriva, 2:vi:17. *M. didyma*.—The series contains forms of the female corresponding with Staudinger's *græca*. The males of the gen. *est.* from Mahmudli are very small, not exceeding 35 mm., and dull in colour.

Pyrameis cardui.—Many dwarf examples from Baisili, vi:17 (Barraud), not exceeding 37 mm., and much worn at that date.

Melanargia larissa.—Since the publication of Mr. Barraud's note on "var. *salonicae* (? Gibbs)," I have received a considerable number of the Salonica form, but after careful comparison with those in the Natural History Museum, I am inclined to think that the range of variation exhibited does not warrant a varietal name for the Salonica examples. The late Mr. A. E. Gibbs, moreover, never published *salonicae*; if ever he described it at all is doubtful. The name, therefore, is *nomen ineditum*. The form of *larissa*, represented in the "Museum Collections" by a single example, is none the less extremely fine and large compared with the smaller and darker form of the Eastern Rumelian Balkan. Indeed, while there is a wide tendency to variation locally, it is never very pronounced, though I can without difficulty distinguish those sent me by Major P. P. Graves from Kuchuk Chekméjé, near Constantinople on the European side, where it flies with *galatea*, from the Rhodope (Slivno), and South Macedonian forms. *Larissa* appears to consort with *galatea* in the latter localities also.

Comparing the several lists now published in the 'Entomologist' with those for the north and east slopes of the central Balkan Rhodope range up to 3000 ft., I find the following Bulgarian species absent from the South Macedonian collections under review: *Thaïs erysii*, *Parnassius apollo*, *Pieris ergane* (which I expect has been overlooked), *Olias myrmidone*, *Zephyrus betulae*, *Thecla pruni*, *Chrysophanus virgaureæ*, *Chilades trochilus*, *Plebeius zephyrus*, *Scolitautes orion*, *Polyommatus croides*, *Agriades escheri*, *A. hylas*, *Hirsutina damon*, *Cupido sebrus*, *Lycena alcon*, *Neptis lucilla*, *N. aceris*, *Apatura iris*, *A. ilia*, *Limenitis populi*, *L. sibylla*, *Eugonia l-album*.

The absence of Argynnids and Erebiæ in the neighbourhood of Salonica has already been commented upon, but the additional information given by Mr. Norton and Mr. Delbanty (*loc. cit.*) of the district between the Vardar River and Lake Doiran supplies two at least of the missing "Pearl-borderededs" in this direction. Others unobserved or wanting are *Satyrus hermione*, *Hipparchia anthe* (?), *H. arthusa*, *Enodia dryas*, *Pararge mera* (it is surprising not to find this usually common species in the lists), *Epi-nephelida*, *Cænonympha leander*, *C. iphis*, *C. dorus*, and *Augiades comma*. All the above occur in the central Balkan as reported by Prof. Bachmetjew ('Horæ Soc. Russ.', vol. xxxv, p. 396). Against this we find the following Macedonian butterflies unrecorded for Bulgaria in 1900 (*cf.* "The Butterflies of Bulgaria," H. J. Elwes, 'Trans. Ent. Soc. London,' 1900): *E. gruneri*, *G. rhamni*, (this seems remarkable), *T. acaciae*, *C. thetis*, *C. ottomanus*, *T. balkanica*, *P. argus*, *L. celtis*, *C. jasius*, *E. antiopa*, *P. tessellum gigas*, *N. marloyi*, *G. nostrodamus*. But taking all things into consideration, it is clear that the Lepidoptera of South Macedonia is even less oriental than that of the regions north of the Balkan impinging on the Euxine. Probably when the scene of our Macedonian campaigns is revisited by a new generation of lepidopterists, the many seeming gaps in the catalogue will be filled up, and other species added thereto. For a variety of reasons, chiefly political and polemical, Macedonia was, until 1916, left severely alone by our pioneer workers. If, as likely, Salonica is destined to become a port and rail-head of the first commercial importance, and peace is really to dawn upon this land of unrest, the time for systematic exploration of the entomological fauna may not be very far distant.

Harrow Weald ; 1920.

COLLECTING IN FINMARK, SWEDISH LAPLAND, JEMTLAND, ETC.

By ALBERT F. ROSA, M.D.

It is some years since I first considered the possibility of a journey to Scandinavia, and the project had been gradually gathering strength as the little difficulties which surrounded the carrying of it out, such as a knowledge of the languages, were slowly cleared up.

Last spring the abnormal conditions prevailing throughout Europe, especially in the central and eastern areas, again caused me to cast my thoughts towards the north, where one might not unreasonably expect there would be less involvement in the settling up of European troubles.

Many difficulties not experienced by pre-war travellers immediately presented themselves. A passport was required,

but in addition permits for the two countries had to be obtained. These I found were not difficult to secure, but as a result of delay in receiving them my expedition was affected adversely from the very beginning. Bread cards had to be obtained, consequently one had to keep oneself in touch with the ration offices, which occupied time, thought, and trouble.

While crossing to Bergen from Newcastle we passed two floating mines at uncomfortably close quarters, and one was exploded, which incidents somewhat enlivened an otherwise rather tranquil voyage. On reaching Bergen I went on at once to Christiania, where I arrived in the morning of June 6th, and in the afternoon took train to Aarnäs, in the province of Odalen.

I had little expectation of doing much here, but could not pass without satisfying myself as to the possibilities of the bog at Disenaaen yielding some of the specialities which have been in the past found there, and I am of opinion had I had better weather conditions I should have turned up not a few of them. The bog itself has, as expected, been still further reduced in size since 1912, when Mr. Sheldon was there, the then remaining half having been reduced by one-third. As it turned out, on my first day here, during an hour or two of feeble sunshine, amongst a considerable number of species observed I found *Glauopsyche optile cyprissus*, *Eneis jutta* and *Tararge hiera*. *Brethis euphrosyne* was abundant, but this was unfortunately the only *Brethis* seen.

I stayed over the next day in the hope that the weather might improve—not that it was wet, because the season had been and continued to be remarkable for its dryness; but there was a persistent absence of sunshine. The sun broke through for a little while, but nothing fresh was seen, and as the third morning promised nothing better I took leave of the province of Odalen, with regret at not having had an opportunity of exploring it thoroughly, took train to Kongsvinger, and booked through Charlottenberg to Stockholm.

The next two days were spent at Stockholm—both of them brilliant—calling at various offices, including the Swedish Touring Club (*Svenska Turistföreningen*), the Consulates, and the Svenska Vetenskapsakademii at Fräskati, where I had an interview with Prof. Aurivillius.

Leaving Stockholm in the evening of the 11th, I went on to Mattmar in Jemtland, arriving there about noon the following day, and had a look round after booking a room at the little hotel. I should mention here that I had only a possible five or six days to spare before I was due in Lapland, so that it was no use thinking of going on in the direction of Storlien, which I thought at first I might possibly manage. My first day here was dull, and I only saw one or two *Chrysophanus amphidamus* and an *Erilia* which I believe was *embla*.

I remained at Mattmar for five days. The most likely bog

on the lower road towards the Storsjö I found had been freely drained, the scrub appeared to have been burned, at any rate at parts, and the surrounding trees cut down, and it proved to be a complete blank. However, on the road and in the neighbouring woods Brenthids were rather numerous; but with the exception of *B. aphirape* var. *ossianus*, the only other species encountered was *B. euphrosyne*, individuals of which were very common and some of them are closely approaching var. *fingal*. *Chrysophanus amphidamas* var. *obscura* was very abundant and in perfect condition, both sexes, the females being very brilliant and varied. I also picked up a few *Erebia embla*, the first being seen on the higher bog on the 12th. This being an odd year the latter species was not expected to be abundant as it is said to be so only every second or even year. The only perfect day here was Sunday, the 15th; the others were dull, or with insufficient sun to tempt many species to fly freely.

Leaving Mattmar in the evening of the 17th, I moved on to Brücke and joined the north-bound snälltag the next morning, arriving at Boden in the evening, where I obtained a sleeping berth in a sofvagn and reached Abisko in Lapland on the morning of the 19th.

"Abisko turiststation," which is truly a very excellent establishment, was to be opened on the 20th, and I had succeeded in arranging to be put up a day or two earlier. The restrictions as regards collecting in this interesting spot are a great drawback, and must be counted upon, and I am afraid there is little likelihood of them being relaxed.

At the time of my arrival there the birches were well out, which forboded no good as far as collecting was concerned, and bad luck still lingered with me, this day proving to be so completely dull that I never saw a single one of the species of which I was in search, but next morning in the swamps well east of the Marble Quarry I got a couple of *Colias nastes* var. *werdandi*, and in the birch woods several *Brenthis freija* and some *Erebia lappona*. Further collecting was prevented by the advent of clouds. Next day was bright, and I overhauled a considerable number of the same species as the day previous, along with some *B. aphirape* var. *ossianus* and *Hesperia centaureæ*.

I stayed at Abisko-jokk for eight days visiting the different places round about: Björkliden, the shores of the Torne Träsk and Lap-porten, on the way up to which I found *Colias* var. *werdandi* and *Brenthis freija* in better condition, *B. aphirape*, *Pieris* var. *bryoniae*, and several times saw another *Brenthis* larger than the others which I believe was *B. frigga*.

C. var. werdandi occurred in all suitable—*i.e.* swampy—places right up, though getting scarcer, to the crests approaching the pass. There is no trail leading up, though one is indicated in the map.

The railway—Ofotenbanen—from Gellivare to Narvik, which, by the way, is the most northern in the world, has been electrified on the Swedish portion, that is, from Gellivare to Riksgränsen next the Norwegian frontier. Two passenger trains are, or were, run daily, one each way; one going to Narvik passed Abiskojokk at 10 a.m., and the other, going inland to Kiruna, Gellivare and Boden, passed about 8.30 p.m.

So leaving in the morning of June 27th I went on to Narvik, and immediately boarded the small steamer for Lødingen, and directly changed there to the larger steamer, the "Polarlys," which had been waiting for us, bound for Hammerfest, which, after we had coaled at Tromsø during the night and passing Skjervøy, was my next stop, unfortunately a three days' one, arriving at this most northern town at 6 p.m. on the 28th, just two hours late for the little boat that plies to Alten twice a week.

Here I was stranded with practically nothing to do two days—Sunday and Monday—brilliant sunshine with a temperature somewhat about 80° Fahr. I was told that it had not been so hot for many years—knowing that each day's delay reduced my chance of getting fresh specimens of certain estimable Arctic species for which I had travelled so many hundreds of miles.

The island of Kvalø, at any rate round Hammerfest, does not appeal to one as a promising collecting-ground, but walking round the bay on Sunday, not expecting to find anything of consequence, I noticed a yellow copper flying rather commonly, and some Brenthids which I felt sure were *freija*. So on the Monday morning I went to the same spot and found *Chrysophanus phleas* var. *hypophleas* (*americanus*, d'Urban) rather frequently, a fine form, and on the rocks overhanging the bay *Brenthis pales* var. *lapponica*, *Erebia lappona*, and several very dark, though worn, *Aglais urticae* var. *polaris* were seen.

I am sure I saw another species of *Brenthis* like *freija*, but the wind was strong and constant, and anything rising was immediately carried away.

I left Hammerfest at 10 a.m. on Tuesday, July 1st, with a feeling of intense relief, though I am bound to say the Hotel Cora Jansen was very comfortable and the food good. The weather had changed during the night, and the wind was bitterly cold. The journey through the Vargsund and the Altenfjord to Bossekop took fifteen hours, the boat arriving at about 1 a.m., and I found that the hotel—save the name—had changed hands, was in a state of upturn and was not available. In these climes people seem to walk about at all hours of the night; there is always somebody about, no doubt due to the perpetual daylight, and I suppose the arrival of the steamer on this occasion would make this more apparent. I got hold of a boy to make inquiries about a room, but he was unsuccessful in finding a place. It was a beautiful night, quite warm, the sun was

shining brightly in a cloudless sky, and I was thinking about how to put in my time till morning when the boy came running up and told me that the doctor, who had heard of my difficulty, had offered me a room in his house, and I am extremely grateful to Dr. Gjessing and his Fru for all their kindness. Dr. Gjessing also obtained rooms for me at Jöraholmen—not unknown to Scottish salmon-fishers—which is a farm situated about a Norsk mile inland on the Alten elv (the Norwegian mile equals 10 kilometres), where I was conveyed by stolkjærre the next afternoon.

In the morning, before proceeding to my new quarters at Jöraholmen, I had only to cross the road to the field opposite the house of my friends to find butterflies abundantly. *Brenthis selene* var. *hela*, *B. pales* var. *lapponica*, *Chrysophanus hippothoë* var. *stieberi*, *Plebeius argus* (*argyrogномон*) var. *lapponica*, *Erebia medusa* var. *polaris*, and a passing *Colias* with a ruddy or violet sheen apprised me of one of the specialities of the district, namely *C. hecla*, several of which were seen hurrying along while I remained at this spot.

Moving on to the marsh beside the church, a careful search produced nothing more than *Pieris napi*, so proceeding inland I captured one or two *Colias palæno* var. *lapponica* in the wooded district, and then was lucky in striking the very farm mentioned by Mr. Rowland-Brown, where I enrolled the services of a boy to row me over the river. I found, however, this was not necessary, because on the near side I found *C. hecla* quite common and easily captured under the shelter of the banks approaching the water's edge. I took in a short while eleven males and one female.

I also here became acquainted with *Oeneis norna*, which, however, was worn, and I also secured one or two more of *C. palæno* var. *lapponica* and *Chrysophanus hippothoë* var. *stieberi*. At this stage I had to stop for want of boxes, so had to return.

After this, my headquarters being at Jöraholmen, where I had very comfortable rooms, and the people, who are accustomed to visitors, very homely, I lost connection with this favoured spot, which will always be remembered as one of the most interesting in my collecting experiences, where the Arctic *Colias C. hecla* was to be found in abundance, and in such good condition.

At Jöraholmen *C. hecla* was even more freely met with, but the males were rarely without blemish; the females were, however, very common—more common than males—and many were in the best of condition. *Plebeius* var. *lapponica* was nearly everywhere. At some parts they could simply be disturbed by the dozen at nearly every step. *C. palæno* var. *lapponica* was found here also, and *Brenthis pales* var. *lapponica* most commonly, as well as *B. selene* var. *hela*. *Erebia polaris* was frequently taken, and *C. var. stieberi* again turned up. *Glaucopsyche optilete*

occurred not commonly on the river bank, but only at the edge of the pine woods, *P. var. lapponica* displacing it on the open bank.

On my last day I essayed to secure *Erebia disa*, though I knew I was far too late for it, exploring the ground between Ebidal and the Skadavaara mountain, but unfortunately the sun went in and I failed to turn it up.

Returning to Bossekop that afternoon by kariol, I called as promised upon my friends who had been so kind on the morning of my arrival, the steamer leaving for Hammerfest about midnight.

At Hammerfest I had to wait again one day for the steamer to Harbin, *en route* to Narvik, so I occupied myself in looking for larvae of *Aglais urticae* var. *polaris*. The difficulty was to find the food-plant. Some of which at last I noticed in a back garden yielded only small larvae: but after another search some more clumps were discovered on the left bank of the river, leading from the Storvand, which flows into the harbour towards the north end of the town. On these the larvae were half grown, and I took about fifty, of which I lost a considerable number through the food-plant becoming mouldy while I was on the boat. I managed, however, not without difficulty, in rearing a few.

After an uneventful journey on board the "Midnatsol," on the night of the 9th July I slept at the Grand Hotel, Narvik, and the next morning netted *Erebia ligea* commonly. *C. var. stieberi* was also taken here, as well as *G. optilete* and *Colias var. lapponica*.

In the afternoon I took train again to Abiskojokk where I put up for two days, wishing to see if any other species had made their appearance during my absence. All the species seen on my first visit had disappeared completely. Visiting Björkliden next morning I found *G. optilete*, *Pieris napi* var. *bryonie*, *Erebia ligea* tending more to var. *borealis*, *Brenthis pales* var. *arsilache* and var. *lapponica*, *Angiades comma* var. *catena*; and I also found here some full-fed larvae of *Aglais urticae* var. *polaris*. The second day was spent on the slopes on the way up to Lap-porten, where I again got *B. pales* var. *arsilache*, *C. palæno* var. *lapponica* and *G. optilete*, the last of which was here obtained in perfect condition. There was a high wind as usual and little sun, and this finished collecting as far as this journey was concerned, and I returned home via Boden, Bräcke and Hallsberg, taking the boat at Christiania for Newcastle, where I was held up nearly two days by the local railway strike.

The following is a full list of species observed and taken, which altogether number thirty-six.

Pieris brassicae, L.—Seen at Mattmar.

P. napi, L.—Several at Mattmar. Var. *napeæ*?—Disenaaen. Var. *frigida*, Seudd.—Males taken at Abisko and Narvik are without spots or apical blotch, and would seem to be near, if not this

variety. The nervures are rather more powdered towards the apex of fore wing. Var. *bryonie*, Esp.—Abisko, not so dark as specimens from the Swiss Alps.

Euchloë cardamines, L.—Disenaaen, not common.

Leptosia sinapis var. *lathyri*, Hb.—Mattmar and Disenaaen, not common.

Colias paleno var. *lapponica*, Stgr.—The males vary greatly in colour. Some are bright sulphur, most of them are very pale and some are as white as the female. One female is of a creamy colour. I have specimens from Bossekop, Jöraholmen, Abisko and Narvik.

C. nastus var. *werdandi*, Zett.—Like all my predecessors I was rather late for this species; some, however, were quite good. Var. *immaculata*, Lampa.—I do not seem to have any varieties except this one.

C. hecla (var. *sulitelma*, Auriv.).—This fine species was to be taken all over the delta of the Alten elf, even in the village of Bossekop, but was found only in the neighbourhood of the river or in adjacent fields. Males were found in good condition at Bossekop. At Jöraholmen females were abundant, more so than males, and it was common to see half-a-dozen of the species on the wing at one time. In the males there is a curious violet reflection very similar to that which is found in *Apatura ilia*. It can be seen quite distinctly in some fresh examples when held in certain positions, and is noticeable when the insect is in flight. I think I have seen it stated somewhere that this violet reflection is found sometimes in *Colias edusa*.

(To be concluded.)

NOTES AND OBSERVATIONS.

SWARMING OF MICRO-LEPIDOPTERA IN AUSTRALIA.—The following observation, quoted from a paper by my expert and esteemed friend Dr. A. Jefferis Turner ('Proc. Roy. Soc. Queensland,' xxxi, 1919), p. 108, is so curious and difficult of explanation that I wish to call the attention of entomologists generally to it. The insect mentioned is a small Gelechiad moth, nearly allied and very similar to the English *Dichomeris (Ypsolophus) fasciella*, expanding about 16–20 mm., and a chemical balance would be needed to find the weight of an individual. "One species, *Dichomeris capnites*, Meyr, sometimes occurs in countless millions. I came upon one of these swarms near Gympie, Queensland, on April 15th, 1906. For 20 yards in length and several yards in breadth along the bank of a small creek the eucalyptus saplings, some of considerable size, were so covered with moths that not only was their foliage completely blackened, but the saplings themselves were actually bowed with the weight. On beating a sapling with a stick it recovered its uprightness, while the moths arose in a dense black cloud, and the rustling sound of their wings

was distinctly audible. The moths were imbricated on the leaves like the slates of a roof. In order to form some estimate of their numbers I captured with a sweep of the net the moths on two large leaves (at the utmost 5×2 in.) and counted 710 specimens. As the leaves on the shrubs were numerous and the shrubs fairly close together, the total number of insects must have been beyond computation." The eucalyptus is probably the food-plant, but these vast numbers cannot possibly have been reared on the particular group of saplings affected. This impulse of congregation recalls in miniature the prodigious flocks of passenger pigeons in North America, roosting over square miles of forest in such numbers that large limbs were broken down from the trees, and the birds were piled a yard deep on the branches; all this overflowing exuberance of life was reduced in forty years to a single bird in the Zoological Gardens at New York, probably now dead.—E. MEYRICK; Thornhanger, Marlborough, April 11th, 1920.

ZYGENA TRIFOLII AB.—On the Downs near Wye last season I took a specimen of *Z. trifolii* with all the wings entirely black with the exception of a pale whitish streak in each fore wing.—F. A. SMALL; 6, Westgate Grove, Canterbury.

EARLY APPEARANCE OF EUCHLOË CARDAMINES.—On February 15th I saw and caught a freshly emerged male of this species. Surely this is very early? The day was warm and spring-like, and had been preceded by a spell of remarkably warm, bright weather. We did not see the species again until March 17th, after which date males were quite common. *Pieris napi* appeared at the same time, also *Celastrina argiolus*. All the hibernating butterflies have shown up in good numbers, notably *Eugoniu polychloros*.—G. G. B. MEADE-WALDO; Hever, Kent.

IRREGULAR EMERGENCE OF DREPANA CULTRARIA.—A small batch of ova of this species hatched on May 23rd, 1919, and fed up rapidly, pupation taking place in July. Either because of the abnormally cold summer, or because they were reared many miles north of their native place, no moths emerged in 1919. Two insects have emerged so far this year—on March 5th and March 20th. The larvae were sleeved out and the pupae kept in an outdoor cage.—H. DOUGLAS SMART; Shelley, Huddersfield.

EARLY SPRING BUTTERFLIES.—*Euchloë cardamines*: Male taken at Muddleswood, Sussex, on March 28th. *Celastrina argiolus*: Two males seen flying in the Brighton streets on March 30th. *Pieris rapæ*: Several males flying at Brighton on March 30th.—F. G. S. BRAMWELL; 1, Dyke Road Drive, Brighton.

PIERIS RAPÆ IN MARCH.—On March 22nd I saw a specimen of *Pieris rapæ* flying in my garden. In 1918 I noted a specimen on March 24th.—W. M. CHRISTY; Watergate, Emsworth, Hants.

PHLOGOPHORA METICULOSA IN MARCH.—I have collected Lepidoptera for many years, and I think the following record is worthy of notice. On March 28th I found a freshly emerged female of *Phlogophora meticulosa*; the wings are perfect and fringes intact, so

that it cannot be a freak that has lived through this mild winter.—VERNON P. KITCHIN; The White Cottage, Oxted, Surrey, March 30th, 1920.

[Although most frequently seen in the summer, one or more specimens of *P. meticulosa* have been recorded for most months of the year.—ED.]

THE "WINTER" MOTHS.—There is an obvious error in my note under this heading in the current number of the 'Entomologist,' p. 92. In lines 7 and 8 it should read, "*P. pedaria*—twenty-three males and thirty-five females." This makes the percentage of females considerably higher.—GEO. T. PORRITT.

WINTER MOTHS.—I do not think any scarcity of winter moths has been very noticeable here this winter, with the exception of perhaps *Cheimatobia boreata*. *P. pedaria* has been very abundant, 50 per cent. at least of which were dark forms, but contrary to Mr. Ford's experience the females were very scarce. The females of *H. defoliaria*, on the other hand, were very numerous.—E. P. BUTTERFIELD; Wilsden, Bradford.

PARARGE MEGÆRA, ETC., IN YORKSHIRE.—Mr. Nimmy's remarks on *P. megæra* in Herts and Middlesex (*antea*, p. 67) brings to my recollection how plentiful this insect was in this district (Wilsden) in the late sixties of the last century, and I believe it has not since been seen in any intervening year. It has disappeared in like manner from other districts in the north of England. Previous to the year 1918 I had never seen *Chrysophanus phœas* in this neighbourhood, but in that year it was not at all uncommon, and in the following year (1919) it was very plentiful. *C. solidaginis*, Hüb., is another species that was apparently absent from this district during the years from 1876 to 1896, when it was turned up quite commonly.—E. P. BUTTERFIELD; Wilsden, Bradford.

HIBERNATION OF AGLAIS URTICÆ.—Referring to the note by Mr. Harold D. Ford in the 'Entomologist' for March, p. 66, perhaps there are few, if any, districts in England where there is such a paucity of butterflies as here, the three species of "whites" being all that can be counted on with certainty. In average years *A. urticae* cannot be called common, but last year there must have been thousands in this neighbourhood in August, but these were met with at somewhat high elevations, very few being seen in the valley. A lady brought one from Egypt near Bradford, where she resides, for determination, and said she had counted about seventeen flying about the flower of what I took to be ragwort from her description. A few days later I had to go to Bingley, and on the higher ground this insect was not only common, but actually swarmed, whilst in the valley very few were to be seen. A few days later I visited Harrogate, where I saw a few, but it was by no means common.—E. P. BUTTERFIELD; Bank House, Wilsden, Bradford.

NOTES ON THE SEASON 1919 FROM BURNLEY AND DISTRICT.—*Phigalia pedaria* was the first species to put in an appearance on February 1st, and continued plentiful until the middle of March.

The best day was February 16th, when 93 were noted (81 ♂, 12 ♀), of which 21 were melanic, and I think this about represents the proportion in the total catch. One specimen was very pale, and one of the melanic males had one wing "diaphanous." April was generally cold, but during a mild period from April 18th to 21st the common species of *Tenioocampa* were plentiful at sallows, and at the same time about a dozen *Panolis piniperda* were taken, about one-third with a more or less greenish appearance. So far my experience is nearly the opposite to that of Mr. Burras in the New Forest (see p. 37). During May *Saturnia carpini* was scarce, also *Aeronycta menyanthidis* and *Hadena glauca*: indeed Noctuidæ generally were scarce during the whole season. May 24th was a warm, lovely day, and insects abounded, *Ematurga atomaria* in variety, *Callophrys (Thecla) rubi* (which seems to be extending its range in Lancashire), *Gelechia ericetella*, *G. longicornis*, *Argyresthia gordartella* and *A. spiniella*, with *Cnephasia politana*, mostly amongst bilberry. June was mostly cold, especially the last week, but during some warm intervals *Hepialus hectus* occurred freely, also *Bupalus piniaria*, one having one fore wing diaphanous. On the 15th quite a number of *Macroglossa stellatarum* were buzzing along a wall in the bright sunshine (would not these be immigrants?). June 22nd: One or two *Tinea fulvimitrella* on trunks, and *Micropteryx aureatella* among bilberry were numerous. I was away during the early part of July, but on the 13th I took *Notodonta dictyoides* on a trunk in a birch-wood (new to district), and a few *Venusia cambrica* were also seen. On August 3rd *Crambus tristellus* was abundant, one very dark brown specimen being taken, also *Paeisca occultana* flying round pine-trees. *Polia chi* were about average, but were over by the end of the month. September was fine generally. *Paeisca solandriana* were abundant and very varied among the birches, also *P. corticana* on oak trunks. On the 9th *Chrysophanus phleas*, which was more abundant than I had ever seen; I took one ab. *schmidti* and one dark form. *Oporabia filigrammaria* was scarce, but at the end of the month *O. dilutata* was numerous. In October *Exapate congelatella* were generally to be found on fine days, also *Chimabache phryganella*, and on the 18th I took *C. phleas*—possibly a partial third brood, as they were in good condition. Of the late autumn I will only remark on the extreme abundance of *Hybneria defoliaria* and *H. aurantiaria*, well over 1000 examples of the former being observed; 31 females were counted on one tree and several hundreds in the wood one afternoon. Naturally they were very varied; all the ordinary forms were noted, while two melanic males and one female and two very light orange males of *H. defoliaria* were obtained; also two *H. aurantiaria*, unicolorous and melanic.—W. G. CLUTTEN: 132, Coal Clough Lane, Burnley, Lancs.

ENTOMOLOGICAL RECORDS (MACRO-LEPIDOPTERA).—In reply to Mr. Ernest Cornell's note advocating a systematic collation of notes and statistics of the relative seasonal abundance, or scarcity of species in various localities, and suggesting myself as secretary, after consulting Major H. C. Gunton, who kindly promises his assistance, I have outlined a scheme which I hope to place before lepidopterists

interested in the June number of the 'Entomologist.'—H. ROWLAND-BROWN; Harrow Weald, April 17th, 1920.

EARLY APPEARANCES.—*Euchloë cardamines*: one was plainly seen here on March 31st (the day before the weather broke). Also a blue which could only have been *Celastrina argiolus*, was seen flying round an ivy-covered house on March 30th.—E. A. C. STOWELL; Eggars Grammar School, Alton, Hants.

MOTHS CAPTURED BY LIGHT-TRAP.—On April 10th the following Lepidoptera were found in my moth-trap: *Cucullia verbasci*, *Spilosoma menthastris*, *Diaphora mendica*, *Selenia bilunaria*, *Eucosmia certata*, *Anticlea badiata*, *Gymnoscelis pumilata*, *Xylocampa areola*, *Pachnobia rubicosa*, *Tæniocampa gothica*, *T. pulverulenta*, *T. stabilis*, *T. incerta*, and *Anisopteryx æscularia*.—FREDERICK GILLETT, Major; Cheriton House, Sevenoaks, Kent.

WICKEN FEN FUND.—This fund is raised annually by entomologists to assist in defraying the expenses incurred by the Custodian of Wicken Fen, the National Trust, in administering and preserving the Fen, and in providing a watcher to protect the plants and wild life dwelling therein. Contributions are earnestly solicited; they should be sent to the Hon. Treasurer, W. G. SHELDON, Youghal, South Croydon.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—February 12th, 1920.—Mr. K. G. Blair, F.E.S., President, in the Chair.—Mr. Withycombe, of Walthamstow, and Capt. Crocker, of Bexley, were elected members.—Exhibition of the genus *Hybernia* and its variation. The Rev. F. M. B. Carr introduced the discussion and exhibition. Messrs. A. A. W. Buckstone, R. Adkin, A. E. Tonge, H. E. Leeds, B. S. Williams, S. Edwards and Hy. J. Turner exhibited the various species and joined in the discussion. Mr. R. T. Bowman specially dealt with *H. defoliaria* as it occurs in Epping Forest.—Mr. Newman, a box of aberrations bought at the Sydney Webb collection, including remarkable specimens of *Arctia caja*, *Hipocrita jacobææ*, etc.—It was reported that *Phigalia pedaria* was out full near Huddersfield on January 17th, and one specimen as early as December 4th, 1919.

February 26th, 1920.—The President in the Chair.—Mr. F. Lindeman, of São Paulo, Brazil, and Mr. S. Abbott, of Catford, were elected members.—Exhibition of lantern-slides. Mr. W. T. Lucas, Oxshott, before and after the "devastation" caused by the cutting of the trees. Mr. Main, illustrating details of the life-histories of the beetles *Cetonia aurata*, *Dorcas parallelopipedus*, *Lucanus cervus*, *Necrophorus humator*, *Nebria brevicollis*, *Pterostichus madidus* and *Rhagium inquisitor*. Mr. Bunnett, ova of *Chrysopa* sps., resting attitudes, a record of changes of form in the amœba during six minutes, the egg-breaker of the larva of *Stenopscus eraciatus*, etc.—Mr. A. A. W. Buckstone exhibited a long bred and captured series of *Himera pennaria* from various localities, and read notes on the

forms included.—Mr. Garrett, an extremely pale xanthic example of *Cænonymphia pamphilus* taken at Wicken.

March 11th, 1919.—Mr. Stanley Edwards, F.L.S., President, in the Chair.—Mr. A. C. Jump, of Wandsworth Common, was elected a member.—Mr. R. Adkin exhibited aberrations of *Pyrameis atalanta*, yellow instead of red coloration, and of *Vanessa io* without eye-spots on the hind wings.—Mr. W. J. Kaye, several striking species of South American *Theclidae*.—Mr. Barnett, series of *Satyrus semele* showing much aberration in the spotting of the underside of the fore wings; a series of *Plebeius aegon*, underside aberrations; and of *Polyommatus icarus*, undersides.—Mr. A. W. W. Buckstone, the 1919 specimens of the three forms of *Agriades coridon* from Shere, Surrey, and read notes on these races.—Mr. L. E. Dunster, underside aberrations of *Polyommatus icarus* with ab. *obsoleta* and ab. *icarinus*.—Messrs. Blair and H. Main, living larvae of *Corethra* sp., *Mochlonyx* sp., *Ochlerobatus nemerosus* and *Anopheles bifurcatus*, all denizens of water, and made remarks on their habits in captivity.—Mr. B. S. Williams, a bred series of the melanic form of *Dysstroma truncata* from Finchley.—Mr. Hy. J. Turner, a large number of Lepidoptera taken in the latter part of 1919 in Jamaica by a member (Mr. D. Pearson).—HY. J. TURNER, Hon. Editor of *Proceedings*.

MANCHESTER ENTOMOLOGICAL SOCIETY.—Meeting held Wednesday, March 3rd, 1920, at the Manchester Museum.—B. H. Crabtree, Esq., F.E.S., in the Chair.—Mr. Harold Halkyard, of Oldham, was proposed a member.—Mr. J. Watson made remarks on some Arctic American butterflies. He exhibited a drawer of *Parnassius phubus* from Irkutsk, Siberia; and *P. phubus apricatus* from Goodnews Bay, Alaska, with *Colias nastes* and a species of Brenthid from the same place; also *Parnassius clodius claudianus* from California and British Columbia, sent to him by Mr. G. O. Day.—Mr. Johnson, a drawer containing the genus *Cormia*.—Mr. H. Britten, a *Sirex gigas* taken at the Museum in 1919, and *P. juvencus* from Flanders.—Mr. Cope, British and exotic Lucanidae, *Rhinoscapha bennetti*, etc.—Mr. Buckley, under the microscope, ichneumoned ova of *P. bucephala*, with the ichneumons which had emerged from the ova.—Mr. Burrows, a variety of *S. menthastris* and *E. pygmaea* from Wilmslow.—Mr. Crabtree, *B. repandata*, *P. plantaginis*, *A. lucernea*, *N. pulverearia*, etc.—W. BUCKLEY: H. L. BURROWS.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, January 19th, 1920, Mr. S. P. Doudney, President, in the Chair.—Mr. J. Davis Ward, Limelhurst, Grange-over-Sands, was elected a member of the Society.—Mr. W. Mansbridge read his report as Recorder for Lepidoptera for 1919.—Five species new to the Lancashire and Cheshire List were mentioned, viz., *Nonagria geminipuncta*, Hatchmere. *Depressaria cucella*, bred from sallow, Formby. *Retinia purdeyii*, Burnley. *Lithocletis sorbi*, Delamere, Eastham and Woolton. *Elachista magnificella*, Sales Wood, nr. Prescot. *Crambus uliginosellus*, new to Lanc. from Holker Moss. In support of the paper, Mr. W. A. Tyerman exhibited a number of his most interesting captures during 1919.—WM. MANSBRIDGE, Hon. Sec.

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NEW SPECIES OF NOCTUIDÆ FROM THE PHILIPPINES.

By A. E. WILEMAN AND RICHARD SOUTH.

Euxoa luzonensis, sp. n.

♂. Head and thorax brownish-grey, abdomen slightly paler. Fore wings greyish-brown, sprinkled with darker; antemedial line black, serrated; postmedial line black, outwardly pale-edged, curved round outer end of cell, thence inwardly oblique to dorsum; subterminal line pale, sinuous, biangulate below middle, inwardly edged with black; terminal dots black; orbicular and reniform stigmata blackish, faintly outlined in pale brown. Hind wings dark fuscous, darker towards termen, discal dot black. Underside dark fuscous, fore wings paler on costa and termen; all wings have a black discal mark.

♀. Similar to the male, but the stigmata are brown, and the subterminal line is whitish.

Expanse, ♂ 40 mm., ♀ 38 mm.

Four specimens (3 ♂ ♂, 1 ♀) from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), November 7th-14th, 1912.

Comes near *E. canariensis*, Rebel.

Agrotis luminosa, sp. n.

♂. Head and thorax reddish-brown, abdomen greyish-brown with reddish dorsal and anal tufts. Fore wings reddish-brown, suffused with darker brown on costal area to the postmedial line; orbicular and reniform stigmata pale ochreous, outlined in black, claviform strongly outlined in black; the reniform is preceded by a black dash, followed by a black streak to termen which is interrupted by the postmedial and subterminal lines; antemedial line pale ochreous, crenulate, outwardly edged with black; postmedial line crenulate, pale ochreous, inwardly edged with black, curved round end of cell, thence inwardly oblique to dorsum; subterminal line pale ochreous, crenulate, interrupted, and wider towards dorsum; a connected series of black dots on termen; fringes tawny brown, chequered with darker. Hind wings pale brown with darker veins and terminal border. Underside fore wings suffused with blackish except on the costal and terminal areas, which are tawny brown; hind wings pale, almost whitish, brown, tinged with tawny brown on costal area, terminal border blackish; all the wings have a black discal dot and transverse line beyond; fringes tinged with tawny brown.

Expanse, 43 mm.

A male specimen from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), November 8th, 1912.

Near *A. mandarinella*, Hampson.

Agrotis marmoraria, sp. n.

♂. Head and thorax brown, abdomen paler. Fore wings pale brown, freckled and clouded with darker: orbicular and reniform stigmata pale, almost whitish, centred with brown, claviform outlined in black; subbasal line black, outwardly pale edged, interrupting a black streak from base to claviform stigma; antemedial line black, inwardly pale edged, crenulate, and slightly bent outward towards dorsum; postmedial line pale, edged on each side by a crenulate brown line curved round cell thence straight to dorsum; subterminal line pale, sinuate, broadest towards dorsum; terminal line represented by black triangular marks; fringes brownish, paler marked at ends of the veins. Hind wings pale fuscous brown, darker on terminal border; fringes pale. Underside whitish-brown suffused with dark fuscous on disc of forewings and on terminal area of hind wings; all wings have a black discal mark and line beyond.

Expanse, 40 mm.

A male specimen from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), November 7th, 1912.

Possibly this may be a colour form of *A. luminosa*.

Agrotis crassipuncta, sp. n.

♂. Head and collar grey, thorax brown; abdomen paler and tuft darker. Forewings grey flecked with red-brown between the antemedial and postmedial lines: subbasal line black, terminating in a longitudinal black mark from the base; antemedial line blackish inwardly edged with whitish, outwardly oblique to vein 1 and thence sharply curved to dorsum; postmedial line blackish, serrated, excurved from costa to middle, thence incurved to dorsum, followed by a series of black dots on the veins; subterminal line blackish, preceded on costa by a double brown spot and by a triangular mark below; terminal line represented by black points between the veins; stigmata indistinct; preceding the reniform is a large black spot, its upper edge cut into by a cone-like pale mark. Hind wings whitish-brown clouded with darker on the terminal area. Underside whitish-brown; all the wings have blackish discal dot and line beyond; the discal area of fore wings clouded with fuliginous.

Expanse, 44 mm.

A male specimen from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), December 5th, 1912.

Belongs to the *c-nigrum* group of the genus.

Cirphis albomarginata, sp. n.

♂. Head whitish, thorax ochreous mixed with brown; abdomen rather paler, anal tuft whitish. Fore wings ochreous powdered with brown, costal and terminal borders whitish irrorated with brown;

apical streak white, from which an oblique brown line runs to dorsum and limits the terminal border; orbicular stigma of the ground-colour set in a white blotch which extends to four black dots representing the reniform stigma; fringes brown, preceded by black dots on termen. Hind wings whitish, silky; all the wings have a black discal dot and dotted line beyond, and there is a blackish cloud about middle of the line on fore wings.

♀. Similar to the male above, but the blackish cloud is absent on the underside of fore wings.

Expanse, 36 mm.

One example of each sex from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), May 12th, 1912.

Comes near *C. decissima*, Walk.

Cirphis cuneata, sp. n.

♂. Head and thorax pale brown, collar with darker lines, abdomen greyer. Fore wings pale brown, a white streak from base along median nervure extending to termen; a less distinct streak along subcostal area, most distinct on terminal area; between these streaks is a blackish, wedge-shaped cloud from termen to cell, a blackish shade below the median nervure and another on dorsum; two black dots in the cell, the first linear and the second punctiform; fringes darker brown. Hind wings fuscous, fringes pale brown. Underside pale brown, fore wings suffused with blackish on the disc; all wings have traces of a black discal dot.

Expanse, ♂ 38 mm., ♀ 36 mm.

Three specimen (2 ♂ ♂ and 1 ♀) from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.). One male captured November 17th and another (type) December 16th, 1912; the female was taken on December 3rd, 1912.

Allied to *C. diagramma*, B.-Baker.

Trachea luzonensis, sp. n.

♀. Head and thorax dark grey mixed with paler, abdomen grey-brown; tarsi dark brown with paler rings. Fore wings brownish suffused with fuliginous; orbicular stigma black, reniform outlined in black; sub-basal line black, outwardly edged with pale greyish-brown on costal area; antemedial line black, crenulate, inwardly edged with greyish-brown, especially towards costa; postmedial line black, double, sinuous, inwardly flecked with greyish-brown; subterminal line grey, sinuous, diffuse; terminal line black, interrupted; fringes greyish-brown. Hind wings fuscous, with black terminal line and greyish-brown fringes. Underside fuscous with traces of a darker discal mark and a line beyond.

Expanse, 34 mm.

A female specimen from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), November 25th, 1912.

Comes near *T. oppositata*, Walk.

Athetis multilinea, sp. n.

♂. Head, thorax and legs grey, abdomen paler. Fore wings grey with faint violet tinge; reniform stigma outlined in brown; sub-basal and antemedial lines brown, the latter wavy, deeply indented before dorsum; a brown transverse shade before antemedial line; central shade brown united with the reniform; postmedial line black, roughly serrated, excurred below middle, thence incurved to dorsum; terminal area clouded with brown, obscuring the sinuous and finely dentate subterminal line; black dots and pale line on termen, fringes brown. Hind wings whitish, tinged with fuscous; discal dot and terminal line darker. Underside of fore wings dark fuscous and of hind wings whitish suffused with fuscous on costal area; a dark discal mark and a dark line beyond on all wings.

Expanse 30 mm.

A male specimen taken Baguio, subprov. Benguet, Luzon (5000 ft.), July 9th, 1912. Another male from Sapiangao, subprov. Benguet, Luzon (5500 ft.), taken December 16th, 1912.

The specimen from Baguio (type) is darker and the markings better defined than in the Sapiangao specimen.

Comes nearest to *A. bremusa*, Swinh.

Proxenus (?) obscura, sp. n.

♂. Head and thorax brown mixed with grey, second joint of palpi grey at tip, third joint blackish; abdomen brown, rather paler than thorax. Fore wings brown freckled with blackish chiefly on basal and terminal areas; orbicular stigma black, reniform indistinct with two white dots on its outer edge; transverse lines blackish, very indistinct, terminal line black with pale dots on it; fringes dark brown, paler at ends of the veins. Hind wings whitish, clouded with fuscous on costa and termen. Underside whitish, the fore wings and outer costal area of hind wings clouded with fuscous; orbicular and reniform of fore wings indicated by pale marks.

Expanse, 28 mm.

A male specimen from Sapiangao, subprov. Benguet, Luzon (5500 ft.), December 17th, 1912.

(To be continued.)

ON A SMALL COLLECTION OF HOMOPTERA FROM
BRITISH GUIANA.

By W. L. DISTANT.

THE following descriptions and notes refer to a small collection sent by Mr. G. E. Bodkin, the Government Biologist of British Guiana, to Dr. G. Marshall, of the Imperial Bureau of Entomology. The specimens were all collected by Mr. A. A. Abraham, who was attached to a survey of a road for bringing down cattle from the interior of the Colony.

Apart from the new species here described, the collection also contained two very rare species. One, *Odontoptera carrenoi*, Sign., a Fulgorid, described by Signoret from an unlocalised specimen, was quite new to the British Museum Collection, and was the first example I had seen; another, a Jassid, belonging to the genus *Peltocheirus*, is represented by a single specimen, quite distinct from the type *P. bigibbosus*, Sign., but which may have been described elsewhere and perhaps under another generic name.

Family FULGORIDÆ.

Echetra modesta, sp. n.

Head, pronotum and scutellum brownish-ochraceous, vertex of head with the margins, a central longitudinal carinate line and two small discal spots on each lateral area, black; eyes fuscous: pronotum with a greenish tint, three concolorous central carinate lines and two central small black spots; scutellum with three discal carinate lines, of which the central is straight and the two lateral irregularly curved, and two somewhat large black spots near each lateral angle; abdomen above almost entirely black; sternum, legs and rostrum ochraceous with a pale greenish tint, face with narrow lateral margins, and three central carinate lines—of which the central is straight and the two lateral curved—black; pro-sternum with a waved black line near anterior angle; abdomen beneath ochraceous; posterior tibiae prominently spined; tegmina very pale castaneous, basal half of costal area virescent, the apical third spotted with greyish-white; wings very pale bronzy-brown, the venation distinctly fuscous-brown.

Length, excl. tegm., 16 mm.; exp. tegm., 44 mm.

Hab.—British Guiana (Cattle Trail Survey), A. A. Abraham.

Echetra abrahami, sp. n.

Head and pronotum dull virescent, each with some small black spots, of which the most prominent are two small and rounded on the disc of each; scutellum more greenish-ochraceous with irregular, angulated, black fasciae; abdomen above black, the segmental margins greenish-ochraceous; body beneath and anterior and intermediate legs greenish-ochraceous, face and clypeus more or less mottled with black, apices of femora, central and apical annulations to tibiae, and the tarsi, black; posterior legs pale castaneous, more or less greenish at basal areas, and with six prominent marginal spines; tegmina pale castaneous, the costal area pale greenish with dark castaneous spots, the discal area more or less spotted with black between the veins, the apical area more greyish-white with darker suffusions; wings black, extreme basal area, two spots on basal half and two somewhat larger on posterior margin greenish or greyish white; pronotum and scutellum centrally strongly longitudinally carinate, and less prominently but obliquely carinate on each lateral area; abdomen above centrally finely longitudinally carinate.

Length, excl. tegm., 15 mm.; exp. tegm., 42 mm.

Hab.—British Guiana (Cattle Trail Survey), A. A. Abraham.

Allied to *E. juseata*, Dist., from Costa Rica.

ABRAHAMERIA, gen. nov.

Vertex of head broader than long, the lateral and anterior margins distinctly, somewhat broadly carinate, the disc thus moderately foveate; pronotum much broader centrally than at lateral angles, laterally concavely sinuate, the lateral angles broadly, obtusely angulate, convexly produced between eyes, the posterior margin moderately concave; face about as broad as long, strongly longitudinally carinate; scutellum strongly carinate; abdomen broad, moderately compressed, about as long in male as head, pronotum and scutellum together; posterior tibiae thickly finely spinose. Tegmina long and slender, about three times as long as broad; wings about twice as long as broad, their apices subangulate. Rostrum about or almost reaching the apical abdominal segment, its second joint very long and sulcate; femora and tibiae strongly sulcate beneath.

The position of this genus in the FULGORIDÆ, *Div. Aphanaria*, is somewhat at present indeterminate.

Abrahameria typica, sp. n.

Head above pale slatey blue, the apical and lateral margins virescent; eyes ochraceous; pronotum brownish, the margins and a central longitudinal carination virescent; scutellum brownish, speckled with ochraceous, a central longitudinal carination and much waved lateral carinations yellow; three small spots on anterior margin, and four unequal spots on lateral areas, black; abdomen above ochraceous, the segmental margins black; body beneath and legs ochraceous, anterior femora and tibiae darker beneath; rostrum ochraceous, almost reaching the apical abdominal segment; tegmina reddish-brown, some spots on costal margin, ochraceous, the apical area spotted with greyish-white, and with an undulating black line extending from base to apex and a more fractured and slender black line near anterior margin; wings carmine-red, the veins and broad apical area black, the latter containing two small pale spots near apex.

Length, excl. tegm., 19 mm.; exp. tegm., 68 mm.

Hab.—British Guiana (Cattle Trail Survey), Takama Ck. N. Berbice, A. A. Abraham.

"COLLECTING FUNGUS-GNATS": REMARKS ON
MR. C. MORLEY'S PAPER.

By F. W. EDWARDS.

MR. CLAUDE MORLEY's paper in last month's "Entomologist" seems to call for two or three comments, which I hereby make in the hope of adding to the inducements offered by Mr. Morley's

remarks to the collection of these interesting insects. In the first place a word of warning may be necessary: The great majority of the species are not, as Mr. Morley suggests, conspicuous and easy to name, but small, obscure and difficult of determination without a close study of the male hypopygium.

The places to look for them (apart from window-panes, which, though not to be neglected, yield a comparatively small number), are steep or overhanging banks in woods, or against cliffs, or at the mouths of small caves, especially if these situations are damp; also the steep overgrown banks of small streams, especially in woods. By sweeping in such places it is often possible to obtain many hundreds of specimens in a few minutes. *Provided that no heavier insects are taken with them* they may all be put into the killing-bottle together, and no matter how tangled the mass may appear, it will be found on shaking it out that only a small percentage have lost more than one leg. They must not be left too long, however, before they are pinned.

The flower-heads of umbellifers are not in my experience very extensively frequented except by members of the subfamily Ceroplatinae, and this will perhaps account for Mr. Morley's curious opinion that this is "the most abundant group as regards specimens." It is certainly the least abundant.

Only a comparatively small number of species live as larvae under decaying bark, most of these being Ceroplatinae. Practically nothing is known as to the life-history of the species of *Macrocera*, which are common and conspicuous flies.

The larvae of the others fall into two groups: those which feed on the spores of fungi or moulds, especially those growing on bark, or on liverworts; and those which feed internally on the substance of various fungi, chiefly Agarics. The first group are exceedingly fragile and delicate, but not difficult to rear once they are safely home. They must not be allowed to become too dry, but require plenty of air, or else they will succumb to mould. The second group are more hardy and are easily reared, though they suffer much from the attacks of parasites. They usually pupate in a cocoon just below the surface of the ground, whereas most of the others merely spin a slight web on the bark or fungus on which they are feeding and pupate in it.

There is still a great deal of work to be done on this family in Britain, especially as regards the life-histories, and if anyone feels sufficiently interested to breed specimens from the larvae the writer will gladly name the resulting flies. An extensive work on the early stages of the family is being prepared by Dr. D. Keilin, of Cambridge University, who, I have no doubt, will welcome co-operation from any quarter. The present writer hopes to be able to publish, in the not very distant future, tables and keys to the known British species.

NOTES ON BRITISH ORTHOPTERA, 1919.

BY W. J. LUCAS, B.A., F.E.S.

DURING 1919 a few somewhat interesting notes and observations were made in connection with our Orthoptera, though perhaps nothing of striking importance has to be recorded.

FORFICULODEA.—*Labia minor*, Linn. in fair numbers was met with in September on a dunghill at Sudbury in Suffolk (B. S. Harwood). *Apterygida albipennis*, Meg. also was captured by beating and sweeping at Sudbury in September (B. S. H.). On the occasion of the South London Natural History Society's excursion to Boxhill on May 31st a considerable number of *Forficula auricularia*, Linn. were observed. Most were females, but there were at least two males. There is practically no doubt that all were hibernated specimens, and this observation therefore confirms the belief that both sexes may pass the winter as imagines. Of some the wing-tips bore a small pale spot. One young nymph was seen. A few weeks later, on June 21st, upon the occasion of an excursion of the same Society to Boldermere, near Wisley, in Surrey, no earwigs appear to have been taken.

BLATTODEA.—*Ectobius lapponicus*, Linn. was taken in July at Goodwood, in Sussex (P. Harwood). *Ectobius panzeri*, Steph., chiefly in the nymph stage, was found swarming in July on *Beta maritima*, Linn. and other plants, close to the edge of low cliffs above the shore at St. Mary's, one of the Scilly Isles (K. G. Blair).

LOCUSTODEA.—Of *Metrioptera brachytera*, Linn. one imago (besides nymphs) was met with at Wellington College, Berks, from July 23rd to 25th (B. S. H. & P. H.). I found it myself on dry ground at the top of the hill facing Oxshott Station, Surrey, as late as October 4th, and took a grey female and a greenish male. I have been accustomed to expect this species on damper ground. Of its congener, *M. roeselii*, Hagenb., B. S. Harwood took several males and one female, and saw nymphs also, near Clacton, Essex, on August 8th. He says that it was his best take of the species, and his first capture since 1913. On August 31st it was common at Shoeburyness, Essex (Blair).

It is always interesting to hear of the occurrence of *Phasgonura viridissima*, Linn. In July it was met with at St. Mary's, one of the Scilly Isles (Blair). J. F. Rayner showed me a male which he had captured on July 17th in long grass at South Stoneham, near Swaythling, Hants. A. E. Boycott sent me a male which he took at Morthoe, in North Devon, on August 5th. It reached me alive in the New Forest on August 8th, having gone to Kingston before being delivered to me at Brockenhurst.

C. W. Bracken met with a few in marshy places at Newquay, in Cornwall.

On June 21st, on the occasion of the South London Natural History Society's excursion to Boldermere, very young nymphs of *Meconema thalassinum*, De Geer were beaten from rhododendrons (F. M. Carr). A male taken by G. T. Lyle on August 27th at Gog Magog Hills, in Cambridgeshire, and sent to me, had a malformed elytron. On October 18th, at Stamer Park, near Falmer, in Sussex, six females were noticed on beech trunks from about 18 in. to 10 ft. above the ground: the specimen 18 in. up the trunk appeared to have been ovipositing in a crack in the bark (A. Sich).

In the New Forest on August 3rd I swept a male *Leptophyes punctatissima*, Bosc. probably off sallow, by the side of Blackwater above Queen's Bower. It was not quite mature, but was found to have become so by the morning of August 16th. No cast skin was noticed in the box containing it, so presumably it was eaten. The long hind legs, though apparently of full size, were bent and seemed to be of little use. The captive was fed on rose-leaves from the garden. A curious habit it had of putting its tarsi in its mouth, perhaps to moisten them so that they might cling the better to the surface on which it was walking. No doubt this would be a useful expedient for the creature when it was progressing upside down on the under surface of the glass lid of its box. On August 13th I took one at the foot of the cliffs near Mudford, Hants. The species was also found at Colchester, Suffolk, in September, and in a garden at Sudbury (B. S. H.), as well as at Hassocks in Sussex (Sich).

ACRIDIODEA.—On April 22nd, at Marlborough Deep, in the New Forest, *Tetrix subulatus*, Linn. was about in considerable numbers, but perhaps not so commonly as I saw it there in 1918; or possibly it did not move so readily, for, though the weather was usually bright, there was a cool air. I caught by hand two males and fifteen females, and missed a great many. The small dark males are very difficult indeed to follow when they leap, or to see upon the ground; so the disproportion of the sexes may not be so great as from these numbers would appear. When on the ground most of the females are also well protected by coloration. Perhaps these grasshoppers leap first and then open their wings as they proceed. Females with fiddle-shaped pale dorsal marking (var. *stylifer*, Luc.) and others with pale longitudinal dorsal streak were taken, though most were of a fairly uniform brown tint. At Newquay C. W. Bracken found a very small colony in a marsh, but he thinks this insect is by no means common in the extreme south-west of England. One had a white line along the centre of the pronotum and the edges of the elytra.

On April 18th a small conspicuously coloured male imago of

Tetrix bipunctatus, Linn. jumped into the water at Duck-hole Bog, in the New Forest. It had pale ochreous antennæ and a mid-dorsal longitudinal band of the same colour, this band being edged with very dark brown about the middle. The rest of the colouring was fairly uniform brown of moderate depth. The next day, on the other hand, I took at Rhinefield a female imago, in colour dark brown mottled somewhat with other shades of brown, but really very uniform in colour. On April 22nd, when its congener was so plentiful, one only was taken at Marlborough Deep—a female almost cream-coloured with slightly darker mottling—perhaps the palest I have seen. At Boxhill, on May 31st, a large dark female with some whitish markings on the hind femora was secured. Near Boldermere, on June 21st, a very small dark male was taken mature, but this could scarcely yet have belonged to the new brood.

On July 5th a female *Gomphocerus maculatus*, Thunb. was taken mature near Horsley, in Surrey. On the 23rd of the same month, near Brockenhurst, in the New Forest, on very black ground, due to a heath fire, this insect was remarkably dark—in some cases almost black, so that no differentiation was apparent between it and the black soil. Again, at Blackheath, Surrey, on September 14th, close to a large burnt area, specimens were taken very black indeed. One could not help feeling that there was in each case some connection between this melanism and the very black surface of the burnt heath.

In the late summer I met with *Mecostethus grossus*, Linn. in several parts of the New Forest. On July 28th, at Duck-hole Bog, I took a male. The next day I took two more males in the same locality. Perhaps they were only just becoming imagines, although the weather certainly was not very favourable on both occasions, sunshine being only intermittent and the air at other times cool. On the 29th I caught and released a nymph. On August 6th, at the same bog, a few more were seen. I expected a greater number, as the day was warm and bright, but possibly even yet they were not generally mature. The next day, at Highland Water Bog, a good number were seen, and I took a male and a female. On August 27th, at a bog near Rhinefield, a female was captured, and a fine female was secured on September 1st at Crockford Bog. On September 5th, at Silverstream Bog, it did not seem very common, or perhaps it did not get up readily. I took three males and two females. Neither of the females, I believe, rose on the wing.

On July 24th W. Evans saw two *Omocestus viridulus*, Linn. at Hillend, in the Pentlands.

On August 13th, at the foot of sandy cliffs near Mudford, amongst sparse vegetation, chiefly brambles on the cliff-foot and marram-grass on the sand, were large numbers of *Stauroderus bicolor*, Charp., generally well assimilating in colouring with the

sand. The females were very large. This species, being able to fly, was not much incommoded by the sand, but a *L. punctatissima*, Bosc, which apparently came out of the brambles, was quite helpless. One or two *Metrioptera albopunctata*, Goeze seemed to try to get back into shelter, as if knowing that the sand would render them helpless. On September 10th *S. bicolor* was very plentiful on the coast at Longniddry, Haddingtonshire, some of them being of a beautiful reddish-purple colour (W. Evans). It was common at Newquay (Bracken). On October 4th it was still about on the darkened soil of Esher Common, Surrey, and a dark tendency seemed to be showing itself.

Near Boldermere a male *Chorthippus parallelus*, Zett. was taken mature on June 21st. Bracken found it common at Newquay. Evans met with it at Loganlee, in the heart of the Pentlands, on August 15th. On August 18th *C. elegans*, Charp. was mature at Holmsley, in the New Forest.

Kingston-on-Thames,
April 12th, 1920.

COLLECTING IN FINMARK, SWEDISH LAPLAND, JEMTLAND, ETC.

By ALBERT F. ROSA, M.D.

(Concluded from p. 115.)

Gonepteryx rhamni, L.—Seen at Disenaaen.

Araschnia levana, L.—I am sure I saw this species at Disenaaen, but I do not seem to have any specimens.

Polygonia c. album, L.—Disenaaen.

Aglais urticae var. *polaris*, Stgr.—Seen on the wing at Kvalø—very dusky examples. Imagines bred from Hammerfest and Abisko larvæ. The ground-colour in some is of a dull pinkish-grey as exhibited in the wild examples. A lesser number have in addition a black band between the middle costal spot and the inner central one. One or two have the ground-colour brighter red, approaching the type.

Euanessa antiopa, L.—Disenaaen.

Brenthis aphirape var. *ossianus*, Hbst.—A few from Mattmar and Abisko.

B. selene, Schiff.—Taken at Narvik and Björkliden, July 10th and 11th. The silver spots are inclined to be deficient in brilliancy. Var. *hela*, Stgr.—Specimens taken at Jöraholmen were of this variety, being deficient of silver spots under-side hind wing, which is more or less dusky. The upper sides also are darker than the type, some of them markedly so. Some show a tendency to have pearly bars between the nervures under-side hind wing. Ab. *thalia*, Hb. (*rinaldus*, Hbst.)—One has no central spots upper-side fore wing, and has bars of dull silver or pearly running between the nervures under-side.

B. euphrosyne, L.—Common at Disenaaen and at Mattmar; also taken at Narvik and Abisko. Var. *singal*, Hbst.—Amongst those taken at the first two localities are examples closely approaching if not of this variety.

B. pales, Schiff., var. *arsilache*, Esp. (form *aquilonaris*, Stichel).—Abisko, July 11th and 12th. Var. *lapponica*, Stgr.—Very common at Jöraholmen. Single specimens also taken at Kvalø and Björkliden.

B. freija, Thnb.—Very common at Abisko, but getting worn. In better condition on the way up to Lap-porten.

Erebia medusa, F. var. *polaris*, Stgr.—Fairly common at Jöraholmen and Bossekop. Quite fresh out, but not easy to get perfect.

E. lappona, Esp.—Common and newly emerged at Abisko, and around Hammerfest.

E. ligea, L.—Narvik, July 10th, fresh out and common. At Björkliden it was also common. Var. *borealis*, Brown.—Some of the latter—Björkliden specimens—are of this variety.

E. embla, Thnb.—Only a very few at Mattmar.

Ceneis jutta, Hb.—Disenaaen bog.

E. norna, Thnb.—Bossekop, worn on July 1st.

Pararge hiera, F.—Rather common in the woods at Disenaaen.

Crononympha pamphilus, L.—I saw this species at Disenaaen, but did not take any specimens.

Chrysophanus hippothoë var. *stieberi*, Gerb.—Taken at Bossekop, Jöraholm and Narvik. The females from Narvik are ruddy copper and those from Finmark are brassy.

C. phlaeas var. *hypophleas*, B. (*americanus*, d'Urban).—Only at Hammerfest on the right or northern side of the bay, where it was common. As with the northern form of the last species the copper is brassy. The underside of the hind wing is pale ash-grey. The spots and borders are very black, broad and distinct. It was not easy to catch on account of the high wind on this wind-swept island: it frequently no sooner showed itself than it was carried away.

C. amphidamas, Esp., var. *obscura*, Rühl.—Very abundant at Mattmar. They were in perfect condition, but very easily tarnished. The females are very varied.

Plebeius argus (*argyrognomon*) var. *lapponica*, Meissn.—This was the most abundant of any species seen. Many females have very little if any blue. Taken at Bossekop and Jöraholmen; and at Narvik and Abisko on my return visit, July 11th and 12th.

Glaucopsyche optilete, Knoch., var. *cyparissus*, Hb.—Specimens taken at Jöraholmen and Abisko do not seem to have such a pale underside as those taken at Disenaaen, but the latter were all worn, which may account for the difference. I got them absolutely fresh out on July 12th near Lap-porten.

Polyommatus icarus, Rott.—Narvik, July 10th. At Jörahol-

men one specimen was taken, which was deficient in size and paler than normal.

Celastrina argiolus, L.—Disenaaen, not common.

Callophrys rubi, L.—Common at Disenaaen and also at Mattmar, but in both cases worn.

Hesperia centaureæ, Rbr.—Abisko, just emerging June 21st.

H. malvæ, L.—Disenaaen, not uncommon.

Angiades comma var. *catena*, Stgr.—Abisko, July 11th.

As already stated the season was a very dry one. I had only three wet days while on suitable collecting ground. One occurred at Mattmar and two while I was at Abisko.

In conclusion I have to thank Mr. H. Rowland-Brown and Mr. W. G. Sheldon for kindly giving me information relative to my journey, and I felt honoured by the interest taken in my work by the Swedish Academy of Science, from which I received a communication when I arrived at Abisko.

28, Pitt Street, Edinburgh.

SOME INDIAN BEES OF THE GENUS ANDRENA.

By T. D. A. COCKERELL.

A small series of Indian *Andrena* received from Mr. T. Bainbrigge Fletcher has given me a good deal of trouble, and I can only hope that I have avoided errors in my account of them. Bingham's key (as Nurse remarked in 1908) is of little use, and the descriptions by Cameron and others are not very satisfactory. I have made repeated efforts to obtain authentic specimens of the species of Nurse and Cameron, but entirely without result. I have Bingham's *A. harrietæ*, but it is a *Melitta*. I have seen *A. balucha*, Nurse, in the U.S. National Museum. There is undoubtedly a large *Andrena* fauna in Northern India, of which the known species constitute only a small part.

Andrena ilerda, Cameron.

♀. Lyallpur, Punjab, July 24th, 1917 (G. R. Dutt), Fletcher 23. I am satisfied that this is *ilerda*, although the hair of thorax above is tinged with fulvous, the stigma is rufous margined with fuscous, and the clypeus is quite sparsely punctured in the middle. Cameron, in his short diagnosis, says the stigma is dark rufous; in his description below he says it is fuscous. A male, also marked 23, bears the label: "Sugar cane, Lyp., Punjab, 16, 12, xi (M. M. L.)." The female very closely resembles *A. bipartita*, Brullé (*urometæna*, Costa).

Andrena ilerda inglisi, subsp. n.

♀. Length about 10.5 mm., ♂ about 11 mm., thus a little smaller than typical *ilerda*; fringe of long hair on fifth abdominal segment

of female pale brown, and on apical segment white stained with reddish (all this hair black in *llerda*). Possibly a distinct species.

Female (type) from Banhar, Behar, December 14th, 1917 (*H. Inglis*): male from same locality and collector, March, 1917. Both are Fletcher 49. Additional characters are as follows:

♀. Mandibles long and falciform, with an inner tooth; malar space well developed; process of labrum broad and emarginate; clypeus convex, polished, with weak sparse punctures, its lower margin broadly reddish; vertex dull, except a shining line along orbits; facial foveæ narrow, white, with an ochreous tint; flagellum entirely red; third antennal joint about as long as next two combined; thorax above with short pale fulvous hair, brighter on scutellum; mesothorax dull, with minute feeble punctures; posteriorly it is more shining; area of metathorax feebly defined, but subrugose, with oblique nearly transverse plicæ; tegulae fuscous; wings faintly dusky; second submarginal cell large and broad, receiving first recurrent nervure beyond middle; tibiae and tarsi entirely clear red, femora darker but partly reddened; hair on inner side of hind basitarsi reddish-golden; abdomen with first four segments red, the first broadly blackened basally; segments 2 to 4 with rather narrow white hair-bands.

♂. Face, front and cheeks with abundant long white hair; clypeus black; flagellum long but stout, black above; only second abdominal segment distinctly red, and this with dusky median and lateral spots.

Andrena peridonea, sp. n.

♀. (Type.) Length about 11 mm., anterior wing 9·3 mm.; robust, black, including clypeus and legs, but first abdominal segment (except a dark L-shaped mark on each side) and base, apex and extreme sides of second ferruginous; third segment with depressed hind margin brown. Head broad; malar space linear; process of labrum broad, not emarginate; clypeus shining, with irregular, large, strong punctures, no smooth middle line; facial foveæ pale fulvous, only moderately broad; antenna black as far as fourth joint, beyond that castaneous red; third joint not very long, but about equal to next two combined; face and cheeks with dull white hair, but it becomes fuscous on front and long and black on vertex; mesothorax and scutellum shining, with very distinct punctures; area of metathorax triangular, covered with coarse irregular rugæ; hair of thorax dull white at sides, faintly tinged with ochreous above; wings yellowish hyaline, with clear ferruginous stigma and nervures; basitarsi rather broad; abdomen distinctly punctured, finely and closely on third and fourth segments, more sparsely and irregularly on first; second segment depressed less than half; segments 2 to 4 with white hair-bands; apex with dense black hair. The second submarginal cell receives first recurrent nervure in middle.

♂. Clypeus black; flagellum entirely black; face with pale ochreous-tinted hair; abdomen red as far as base of fourth segment but first with a broad black band connected with longitudinal latera

ones, leaving a triangular red central area, second and third with broad, dusky, transverse bands.

Both sexes, Hangu, N. W. J. P., May 10th, 1916 (*Fletcher*, 34, 35.)

Resemble *A. ilerda*, but easily known by the stronger punctures and other characters.

Andrena comberiana beharica, subsp. n.

♂. (Type.) Abdomen with apical margin of first segment, second, except a broad black band (which may be interrupted sublaterally), and base and apex of third, all yellowish ferruginous. Clypeus creamy white with two black spots, as in *comberiana*; no lateral face marks.

♀. Third abdominal segment often with a broad black band, but sometimes with only lateral spots.

Banhar, Behar (type locality), 3 ♀, 5 ♂ collected by H. Inglis (*Fletcher*, 47, 48.) The females are dated April 10th, 1919, the males April 7th and 8th. One male is from Chapra (*Mackenzie*), Fletcher 15. This is certainly only a local race or subspecies of *A. comberiana*, Ckll., described from Karachi. It belongs to the *nitidiuscula* group as defined by Perkins.

NOTES AND OBSERVATIONS.

ENTOMOLOGICAL RECORDS (MACRO-LEPIDOPTERA).—At the meeting of the Entomological Society of London on March 17th, Major H. C. Gunton read a paper entitled "Entomological-Meteorological Records," and exhibited a chart showing observations of Macro-lepidoptera during the year 1919 in special relation to the relative abundance of species occurring in the Gerrard's Cross district, Bucks, under the meteorological conditions obtaining on the dates of observation, and to the effect of weather on time of appearance. It has further been suggested by Mr. Ernest Cornell, of Ventnor (*antea*, pp. 90-91), that a bureau should be established for the purpose of ascertaining the occurrence and seasonal abundance of species in various appointed localities throughout the United Kingdom. Mr. Cornell is also good enough to invite me to act as central Secretary, with a view to the collation and co-ordination of local reports. I am quite willing to act in this capacity, provided I receive adequate support in the way of records from local observers. To be of scientific value there must be comparable reports handed at the end of each year from the local centres appointed, and I have conferred with Major Gunton in order to determine the methods best suited to meet requirements. We are of opinion—(1) That the scope of the investigation, at present, be confined to observation of the Macro-lepidoptera in the imago state only. (2) That the selection of districts, where possible, be made in relation to the official meteorological observation posts. (3) That records be compiled on a uniform model (*e.g.* as set out below). (4) That a note of nature of soil of localities cited be appended to each

record when complete; ordnance maps will indicate other general characteristics of districts selected. (5) That momentary local weather conditions only be recorded, the Secretary being responsible for the general regional meteorological conditions. (6) That occasional seasonal notes be inserted in the "Remarks" column referring to state of vegetation, blossom, etc. (7) That, in the case of rare local species, no precise localities will be made public.

SUGGESTED FORM OF RECORD.

Locality—Uxbridge, Middlesex.

Period—January—December, 1920.

Date.	Time.	Weather.	Species.	Sex.	Conditions.	Remarks.
23/3	10 a.m.	Misty	<i>H. leucophaearia</i>	♂	Settled; oak trunks	Three.
23/3	3 p.m.	Sunny	<i>B. parthenias</i>	♂	Flying; birch plantation	One.
23/3	9 p.m.	Overcast	<i>T. pulverulenta</i>	♀ ♂	Sallows	Abundant; sallow bloom nearly over.
10/4	9 a.m.	Showery	<i>X. areola</i>	♀	Settled; paling	One; practically all trees foliating except oak, beech and ash.

Name of Observer.....

Address

I shall be obliged, therefore, if lepidopterists willing to assist as observers will kindly communicate with me, so that if sufficient support be forthcoming, a start may be made this year, and at once. I ask particularly the support of local natural history societies and of observers in remoter parts of the country, in Scotland and the Isles, in Ireland and in Wales. Secretaries of societies are also requested to bring the scheme to the notice of members.—H. ROWLAND-BROWN: Harrow Weald, Middlesex.

MONKS WOOD.—I am sure entomologists will be sorry to hear that the celebrated Monks Wood, Hunts, will soon be a thing of the past, with disastrous results to many a local insect. Lord Chesham having sold the estate, the woods have been purchased by an American company, who are, I hear, cutting down all the timber, and making a clean sweep of this fine old collecting-ground. Having spent many days (and nights) in this rich locality, one cannot but regret such an end to one of the best known collecting-grounds in the country.—R. TAIT: Roseneath, Harboro' Road, Ashton-on-Mersey, Cheshire.

MONKS WOOD.—In the early days of my teens, when I first began seriously to collect butterflies, I used to study with keen interest the lists of places reputed to be good localities for certain rare species. In course of time the names of those places became to me almost synonyms for the names of the insects in question, and

my ambition to capture the butterflies became one with my desire to visit the places. In the years that have passed since those days of fresh enthusiasm, I have added to my collection most of the insects without having visited the notable localities, with but one or two exceptions. The truth is that these lists, which have, year by year, become longer, are simply the names of places where the insects have been taken at one time or another, and it does not by any means follow that a butterfly found in a given place twenty, ten, even five years ago, is still to be had for the mere journeying thither. By far the wiser plan for every ambitious entomologist to pursue is to carefully study the insects in the place where he happens to be, rather than indulge vain cravings to visit places where they may have been. Among the spots which were thus early enshrined in my memory was Monks Wood, Huntingdonshire, which, in every list, was given as a locality for quite a number of rare species. One realises now that it was not so much the place, as the man, constantly and closely on the watch, who lived in the district, kept careful notes and gave them to the world; but, nevertheless, when an opportunity of visiting the place occurred, I looked forward, notwithstanding that I had already filled all the blanks in my cabinet which Monks Wood seemed representative of, with a curious sensation of having at last attained to one of my early ambitions. It was a fine, albeit cloudy day in early July when, in company with an enthusiastic botanico-entomological friend, I cycled along the fine surface of the Great North Road from Alconbury Weston to the narrow by-road which leads to the extensive woods that bear the time-honoured name. This part of the county entirely belies its general reputation as a fen district. Hills, quite steep enough to render walking a necessity at times, overlook pleasantly undulating stretches of cornfield and meadow, with here and there deep green patches of well-grown woodland, dense, if not of very great extent. To the eastward, it is true, there stretches away a monotonous level, now rich corn and meadow land, yet still strikingly suggestive of its former marshy state, when the swallowtail was an almost unnoticed beauty to be seen over the whole district, and where the much-to-be-envied entomologist of those days could capture his fill of the now extinct Large Copper. A couple of miles of level and somewhat uninteresting road brought us to the edge of the woods, just outside of which the first indication of the distinctive character of the local flora was visible in the shape of some well-grown specimens of the Angelica springing from a ditch filled with the ordinary vegetation of a moist position in any part of the south. A few yards beyond this we entered the woods, which are in two large blocks separated by a broad meadow, the road running on the inside edge of the most southerly half. We rode slowly along, keeping our eyes open for a suitable break in the undergrowth to permit of pushing our machines into cover. This appeared shortly in the form of a circular opening covered with tall grasses and meadowsweet, and splashed all over with gorgeous spikes of purple loosestripe. We entered and stayed a few moments, seeing nothing, however, but a few specimens of *Epinephele (janira) jurtina* and *Aphantopus hyperanthus*. There was, however, an abundance of the common Plume Moth, *M. ptero-*

dactylus, flying over the brambles. Finding the wood somewhat too dense at this point, we proceeded a little further along the road till we came to a broad ride covered with low-growing brambles—a very likely spot for many of the typical woodland species. That ride will long live in my memory as the most beautiful piece of woodland I have ever seen. Immense patches of willow herb of several species splashed the opening with their vivid colour, and contrasted strongly with the golden star of the upright St. John's Wort, which grew in the greatest profusion. Around all immense masses of meadow-sweet stretched to the very horizon. Never have I seen such quantities. For miles along the roadside it ran in a broad white ribbon and made the air heavy with its fragrance. Notwithstanding its attractive appearance, the ride yielded nothing except a few common whites and a single specimen of *Dryas paphia*, and lunch-time having arrived we sought refuge from the attentions of the most exasperating flies I have encountered since I last visited the New Forest in the wide meadow between the two woods. Here there was evidence of a distinctly more interesting local fauna. Hundreds of cocoons of the familiar Burnet moth of the south coast (*Zygaea filipendulae*) smothered the grass stems, and towards the centre of the meadow the insects themselves appeared in the greatest profusion, every thistle-head being crowded with as many as it could comfortably accommodate. We took two nice varieties of this species, one with an extremely small spot at the anal angle, the other with the two hinder spots coalesced into a broad red patch. The next thing of interest to appear was the Marbled White, which was apparently just hatching out, the specimens being in perfect condition. This insect is one of the most curiously local of all the widely distributed species, being often found in the greatest abundance in one field and hardly to be seen in the next. A large number of specimens of *Argynnis aglaja* were seen in the meadow from time to time. Had the day been sunny I imagine there would have been swarms of this elegant species. The edge of the northern wood on this side looked an ideal place for the Hairstreaks, but close scrutiny failed to reveal any of these in either form, but the variety and beauty of the wild flowers growing on the margin of the encircling ditch was most striking. A couple of hours here yielded nothing further of special interest, so we took the road once more and came round to the north-western corner of the same wood. There was a striking difference in the appearance of the vegetation here, some mallows and other local plants being noticed which were not to be found on the southern side. It was growing well past four and, no sun having appeared, there seemed little probability of seeing any more butterflies. We walked along the rough track at the edge of the wood, which was here composed largely of young oaks, but saw nothing of special interest until just near the end, when a solitary female of *Zephyrus (Thecla) quercus* was found resting on the ground. Well satisfied with a most enjoyable day, we turned our wheels towards the line of double telegraph poles that marks the great Roman highway to the north. On the whole, although we did not, as was perhaps hardly to be expected on a cloudy day, meet with any of the rarities, it was made quite clear that there are still great

possibilities of the existence in these beautiful woods of some of the rarities formerly taken there. At all events, no entomologist or botanist could spend other than a profitable and enjoyable day in this out-of-the-way corner of Cromwell's county.—HERBERT MACE; Fairecotes, Harlow.

EUPITHECIA PUSILLATA IN DERBYSHIRE.—It seems, perhaps, worth while to record in the 'Entomologist' the occurrence of this species in Repton Shrubs, as the locality is so far outside its recorded range. Apparently it is well established in one small group of old spruce trees, as upwards of twenty specimens were taken in two consecutive afternoons. It is curious that it should have so long escaped notice in a wood that has been so regularly investigated, but it does not appear to be present in other groups of spruces in the wood, and this particular clump had probably never been searched at the right time of year. *Coccyx fimbriana*, also not hitherto recorded from Derbyshire, occurred fairly freely in the same wood this March, but that is a species more readily overlooked.—H. C. HAYWARD; Repton, Derby.

SCARCITY OF SPRING INSECTS.—I wonder if collectors in other districts are undergoing the same experience that is to be met with here. The moths common to the three first months of the year were all to be met with in fair numbers, including *P. strataria* and *A. hispidaria*, while *X. areola* was also seen in its usual numbers. At sallow the *Taeniocampas* were not up to the average, though *gothica*, *pulverulenta*, *stabilis*, *incerta*, *munda*, *opima* and *gracilis* were all taken, as was also *P. rubricosa* and *O. vaccinii*. With the passing of the sallows insects seem to have ceased. A list of those observed or taken consists of the following species: *E. abbreviata* (2), *E. pumilata* (1), *L. carpinata* (2)—last year this species was, as usual, common everywhere in woods. *T. crepuscularia*, common in our fir woods as a rule, furnished about half a dozen specimens this year. In addition to these may be added two specimens of *L. suffumata* and one extraordinarily early specimen of *X. fluctuata* (April 25th), a fair number of *A. badiata*, and one or two *S. bilunaria*. With the exception of a few specimens of *B. parthenias* in April, and of *E. atomaria*, just beginning to be seen upon our moors, the foregoing list comprises every species noted since the middle of April. As to butterflies, the same scarcity is apparent. *Aglais urticae*, unusually plentiful at this time last year, has afforded a few odd specimens; *C. rubi* is appearing in moderate numbers, but of the "whites" two specimens only of *P. rapae* have been seen, April 28th and May 3rd; neither *P. brassicæ*, *napi*, nor *E. cardamines* have put in any appearance at all. On the other hand, vegetation is unusually forward; both the trees and hedgerows are at least a fortnight in advance of what they were in 1919. To me this scarcity of insect life at present is quite inexplicable. Is it being experienced in other districts than ours?—H. D. FORD; Thursby Vicarage, Carlisle, May 15th, 1920.

MACEDONIAN BUTTERFLIES.—I have read with interest Mr. Rowland-Brown's notes in this month's 'Entomologist' on Macedonian butterflies, and have gone carefully through the other articles which have appeared from time to time. I was pleased to find that

the collection I gave to the Museum contributed so many new species, particularly as Capt. Barraud and I were serving in the same Division, and must have worked over very similar ground. I was handicapped by lack of knowledge, having done no collecting since 1904, and my knowledge was only a rudimentary one of the British and North German species. There are, however, two omissions of some importance. They are:—*Brenthis hecate*: I took one worn specimen near Kopriva Bridge on the Struma between June 14th and 27th, 1916. This was included in the collection given to the Museum. *Apatura ilia*: I took three specimens of the form *clytie* which appear to be identical with the specimen figured on Plate XXXV, No. 2 (right hand side), in Lang's 'Rhopalocera Europæ.' These were taken between June 14th and 27th, 1916. I saw several others, all worn, but it was a difficult insect to capture. Two of these specimens are in the Museum collection. In addition I saw one specimen of the typical *ilia* resting on blackberry flowers, but as usual my net caught in the brambles. This was between the same dates. In addition the following notes may be of interest:—*Euvanessa antiopa*: I saw a single specimen in early spring (probably March), 1917, near Kopriva Bridge, when I had no net. *Epinephelus tithonus* has so far only been reported by Mr. Norton and Mr. Delbanty. I took some specimens at Sneyee in August, 1917, but it was not common. I thought these were in the Museum collection, but they did not appear in the list of species which Mr. Riley sent me after going through them. In conclusion may I point out that "Ferezei" and "Feragli" in the article should be "Ferezli," and "Ormonti" should, I think, be "Ormanli." D. BLANCHARD; 16, Warneford Road, Oxford, May 14th, 1920.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, February 4th, 1920.—Miss Winifred E. Brenchley, D.Sc., F.L.S., Rothamsted Experimental Station, Harpenden, Herts; Messrs. Alfred Ellis Burras, 3, Connaught Road, North End, Portsmouth; Albert Ernest Hodge, 14, Astonville Street, Southfields, S.W. 18; Rev. Melville Jones, 16, New Bridge Street, E.C. 4, and Hope Fountain, Box 283, Bulawayo, Rhodesia; Messrs. George Beddome Curtis Leman, George Curtis Leman, Sydney Curtis Leman, Wynyard, 152, West Hill, Putney Heath, S.W. 15; and Frank Reginald Mason, Oxford, Harpenden, Herts, were elected Fellows of the Society.—The President announced that he had nominated Dr. A. D. Imms, the Rt. Hon. Lord Rothschild and Mr. W. G. Sheldon as Vice-Presidents.—Prof. Poulton, F.R.S., exhibited a coloured figure to illustrate the protective movements of the conspicuous larva of the Catoealine moth, *Cocytodes carulea*, Guér., in Fiji; also the moth bred from one of the larvae by Mr. H. W. Simmonds.—Prof. Poulton also drew attention to an observation by Mr. W. Feather at Kibwezi, B.E. Africa, that of bats flying in a room and taking moths, mainly *Cyligramma latona*.

Cram., and *limacina*, Guér. As long as the moths were on the wing the bats caught them, but immediately they came to rest on the walls or ceiling they were quite safe, the bats, although flying past them quite close, never attempting to take them.—Prof. Poulton also gave his experiences of *Musca autumnalis*, De G. (*corvina*, F.), hibernating in a loft at St. Helen's, Isle of Wight, as in 1914–15 and 1917–18, and exhibited example of the rare Ichneumonid, *Ophion undulatus*, Grav., bred from *Bombyx quercus*, L., cocoons, from N. Staffordshire.—Prof. Poulton also communicated Mr. W. Feather's observations on the red (*gregoryi*, Dist.) and green (*speciosa*, Melich.) forms of the Homopteron *Ityraea nigrocincta*, Walk., at Kibwezi, B.E. Africa.—Mr. G. Talbot exhibited the following species on behalf of Mr. J. J. Joicey: A melanic aberration of the female *Dasyopthalma rusina*, Godt., in which the bands are only present as vestiges; dark aberrations of the male *Papilio ridleyanus*, White, in which the red spots of the fore wing are obscured by dark scaling. A ♂ example of the very rare and extraordinary species, *Papilio phidias*, Ob., from Tonkin, and a number of *Heliconius*, spp., from Matto Grosso.—Mr. E. B. Ashby exhibited the following species of European Orthoptera from N. Italy: *Forficula auricularia*, L., *Acrida nasuta*, L., *Staudingerius bicolor*, Char., *Chorthippus (Stenobothrus) dorsatus*, Zett., *Epacromia thalassina*, Fabr., *Pachytylus danicus*, L. (*cinerascens*, Fabr.), *Edipoda miniata*, Pall., and *E. cærulescens*, L.—Mr. Hy. J. Turner exhibited a tinted photograph of the larval habit of assembly, when not feeding, of *Morpho lærtes* (?), sent to him by Mr. F. Lindemann, of São Paulo, Brazil, and also a coloured photograph of the pupa *in situ* showing its close protective resemblance.—Mr. Hy. J. Turner also exhibited several races of the very variable *Zygæna transalpina* from peninsular Italy, sent to him by Signor Querci, and stated the relationship of the various forms as explained by Dr. Verity, of Florence.—The Rev. F. D. Morice exhibited a book of Charles Darwin's ('Descent of Man') given by the author "with kind regards" (autograph) to the late Mr. Roland Trimen. He also called attention to the very abnormally developed hind-legs of a ♀ bee of the genus *Megachile* from Mesopotamia, apparently belonging to a section of the genus in which no character at all similar had yet been described in either sex. He did not feel able to say for certain whether the character was specific or a case of monstrosity, but at present inclined towards the former opinion.—Lord Rothschild, F.R.S., exhibited two aberrant specimens of the genus *Plusia* in which remarkable aberration is very unusual. The one was a specimen of *P. gamma*, the other the beautiful example of *P. pulchrina* described and figured in the 'Entomologist' (antea, p. 2).—Dr. C. J. Gahan exhibited specimens of the East African Flatidae named *Ityraea patricia*, Melich., *I. speciosa*, Melich., *I. electa*, Melich., and *I. gregoryi*, Dist., and said he believed them to be all forms of the South African species *Ityraea nigrocincta*, Walk., with which they agreed in structural characters.

Wednesday, March 3rd, 1920.—Comm. J. J. Walker, M.A., R.N., F.L.S., President, in the Chair.—Messrs. E. H. Blackmore, President of the British Columbia Entomological Society, P.O. Box 221, Victoria, B.C.; Ernest Hargreaves, Zoological Department, Imperial

College of Science, South Kensington, S.W. 7; Arthur Loveridge, Nairobi, British East Africa; and John George Rhynehart, Harris-town, Taghmon, Co. Wexford, were elected Fellows of the Society.—The President announced the death of Dr. Gordon Hewitt.—Seasonal dimorphism in *Androconia*: Dr. F. A. Dixey exhibited some outline drawings showing variation in form between the scent-scales of the spring and summer form of certain butterflies.—Mr. H. J. Turner exhibited a collection of butterflies from Cyprus.—Capt. J. Waterston exhibited and commented upon a series of Macedonian Odonata.—Mr. Talbot, on behalf of Mr. Joicey, exhibited numerous new and little-known forms of Rhopalocera from Central Ceram.—Mr. G. J. Arrow showed a series of lantern-slides to illustrate different types of armature occurring in Lamellicorn Beetles.—Mr. Riley exhibited aberrations and species of *Lycenidae* from Ceylon on behalf of Mr. W. Ormiston, of Kalupahani, including ♂ ♀ of an apparently undescribed *Arhopala* species, and *Aphnaeus nubilus*, Moore. This would appear to be a good species. It is quite constantly different from the *Aphnaeus* known in Ceylon as *A. ictis*, Hew.—Prof. Poulton, F.R.S., exhibited and illustrated by a lantern-slide examples to illustrate the attacks of birds on butterflies witnessed in Nyassaland by W. A. Lamborn. The marks of a bird's beak were recognisable on rejected wings.—Prof. Poulton also read a note on "Observations on the Enemies of the Larvae of the Pierine Butterfly, *Catopsilia florella*, in East Africa," by Mr. W. A. Lamborn, F.E.S., at Karanga.—The following papers were read: "Butterflies of Cyprus," by H. J. Turner, F.E.S.; "An Undescribed Lycaenid from Cyprus, *Glaucopsyche paphos*, n. sp.," by T. A. Chapman, M.D., F.R.S., etc.—G. C. WHEELER (Rev.), *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—March 25th, 1920.—Mr. K. G. Blair, B.Sc., President, in the Chair.—Mr. A. W. Buckstone exhibited series of *Brephos parthenias* from Wimbledon, Oxshott, West Wickham and Darent and pointed out local characteristics, also ova of *Apocheima hispidaria*.—Mr. B. S. Williams, a striking new form of *Cidaria* (*Dysstroma truncata*) from Finchley; the basal third black, margined by a conspicuous white line.—Mr. Hy. J. Turner, three species of *Utetheisa*, *U. pulchella*, several localities, ab. *candida*, Natal, ab. *totrix*, Assam and New Ireland, ab. *thyter* (?), Cyprus; *U. ornatrix*, warmer parts of America, and *U. bella* sub-sp. *renusta*, Jamaica.—Mr. Blair, galls of larvae of *Superda populnea* (Col.) in stems and twigs of aspen.—Mr. Barnett reported for March 21st at Oxshott, *B. parthenias* (abundant), *X. areola*, *T. crepuscularia*, *T. punctularia*, *T. carpinata* and *G. rhamni*, and at Ashleas *E. polychloros*. Reports showed general scarcity of spring larvae, larvae very small, larvae of *A. caia* in fair numbers, *B. parthenias* in swarms, *H. leucophaearia* scarce, *E. cardamines* out, and *E. polychloros* in various places.

April 8th.—Mr. G. Edwards, Vice-President, in the Chair.—Mr. S. Gordon-Smith, of Boughton, Cheshire, was elected a member. A resolution was passed strongly condemning the proposal to enclose portions of Wanstead Flats and of Epping Forest for permanent allotments. There was a special exhibition and discussion of

Dysstroma (Cidaria) truncata; Messrs. Bowman, Turner, Newman, Mera, Tonge, Williams and others took part. Mr. Bowman dealt particularly with the race (new) with which he and Mr. Williams had met; Mr. Turner summed up the variation of the species and its differentiation from *D. citrata (immanata)*.—Mr. Newman, a specimen of the curious gynandromorph of *Hybernia marginaria* taken at Chailly, Sussex.—Mr. Harding, the aberrations of *Aglais urticae* bred or captured by him during the last forty years, with a chrome-yellow banded *P. atalanta* and a chrome-yellow *H. jacobaeæ*.—Mr. Tatchell, a fine xanthic *Epinephele tithonus* from Dorset, and a living larva *in situ* of *Trochilium crabroniformis* in a willow stem.—Mr. Burnett, imagines and larval cases of the Psychid *Taleporia tubulosa* from Farnborough, and the beetle *Dorytomus tortrix* bred from poplar catkins.—Dr. Robertson, larvæ of *Plusia iota*.—H. J. TURNER, Hon. Editor of *Proceedings*.

RECENT LITERATURE.

Entomologisk Tidskrift, 1918, 1919. Uppsala.

The complete volume of the 'Entomologisk Tidskrift' for 1919 contains much interesting reading for British lepidopterists, especially among the "Shorter Communications and Notes." *Pyrameis cardui pallida* has been reported as far north as the Syd-Varanger by Sandberg, and by Zetterstedt in Lapland. Herr Einar Wahlgren now gives an account of a migration in 1918 (?) reaching south-west Skaonia, the extreme south-west province of Sweden, with data which go to prove that the wandering *cardui* there, as with us, produce a further generation even in this northern latitude; and his observations are supplemented by Herr E. Welander to the same effect in the Malmö district. The latter, also, records oviposition of *Nemeobius lucina* on the underside of a leaf of *Anemone nemorosa*—possibly a mistake on the part of the female, as there were plants of *Primula veris* growing near. Even more interesting, in view of the recent discussion in the 'Entomologist' of the distribution of *Zygæna (Anthrocera) exulans* in Scotland (*cp. op. cit.*, vol. lii, pp. 217–226), is Herr C. O. von Porat's note on the discovery of this "decidedly northern (var. *vanadis*, Dalm.) species" at Ternholt, near Jönköping, in the summer of 1918, a district to which I paid a flying visit at the end of June, 1906 ('Entomologist,' vol. xxxix, p. 222). Jönköping, 57° 45', on the south shores of Lake Vättern, is in almost precisely the same latitude as Braemar, and authentic *exulans*, typical or var. *vanadis*, do not appear to have been detected hitherto south of Dalarna between lat. N. 61° and 62°. In the Arctic it is not necessarily an Alpine insect; Ternholt, in Skaonia, is about 700 ft. above the lake. Another paper on the "West-Arctic Element in Scandinavian Butterflies" will appeal to all students of geographical range. Herr Einar Wahlgren further contributes a valuable note, "Über drei Zetterstedt'sche Geometriden," discussing the specific value of *Acidalia annotinata*, *A. relicata*, and *Larentia decrepitata* respectively. In the 'Tidskrift' for 1918, which has only recently come to hand owing to war conditions, will be found a useful collection

of notes on the life-histories of the Swedish butterflies, as well as comments upon the variation and nomenclature of the Lepidoptera taken by Mr. W. G. Sheldon in his Scandinavian travels in 1911 and 1912, and described in this magazine (vols. xliv, p. 357, xv, p. 311, and xlvi, p. 11). The same paper gives a summary of the forms of *Plebeius argus*, L. (?) (*false, argyrogynomon*, Bergstr.), from the Torne-trätske (Swedish Lapland) region, considered by me in "Some Notes on *Plebeius argus*," etc. ('Entomologist,' vol. li, pp. 73-82), compared with the *argus* of the Stockholm district, e.g. ab. *crassipuncta*, Courv., and ab. *disco-elongata*, Courv. An albino female is figured and described (= ab. *lutea*, Car.), and it is rather unexpected to hear that the butterfly was still on the wing as late as August 20th at 68° lat. N., including the ab. *retro-juncta*, Courv., *retro-puncta*, Courv., *parri-puncta*, Courv., and a male *trs. ad sagittata*, Courv. Is it too much to hope that some day *argus-lapponica* will turn up in Scotland, and incidently have the *aepon* taken at the highest northern limit of Scotland ever been systematically examined for the purpose? Or, are there any Scots *aepon* in existence? Tutt says it is exceedingly rare or has been overlooked, and only cites two localities—Argyllshire, Port Ellen (W. Braunston-Jones), and Perthshire, Perth (Dr. Buchanan White, 'E.W.I.' vii, p. 147), and near the Pass of Killiecrankie (Morison, 'E.W.I.' vii, p. 169). Mr. Meyrick fixes the northerly extreme at Aberdeen. I shall be much obliged, therefore, if any of our collectors who have met with the species north of the Border will communicate their experiences. Meanwhile, looking through these two volumes of the 'Tidskrift,' it is clear that the Scandinavian insectsoffer a rich field for research and speculation to those concerned with the affinities of the Lepidoptera and other orders occurring in North Britain and the north-western limits of continental Europe. The Swedish entomologists are to be congratulated on their enterprise and activities in observing and publishing particulars of their own fauna, not least because they afford great assistance to ourselves in understanding the problems of origin of so many of our indigenous insects.

H. R.-B.

OBITUARY.

We much regret we have to announce the death of Mr. D. Chittenden, of 188, Beaver Road, Ashford, Kent, on April 20th last, at the age of seventy-two years.

As an entomologist he was chiefly interested in Lepidoptera. He became a member of the South London Entomological Society in 1888 and resigned therefrom in 1912. We understand that he leaves a fine collection of British Lepidoptera and that he specialised in the Noctuidæ.

Although of late years he was unable to devote much energy to collecting he was a keen worker, and happiest when "sugaring" at night. During the course of his lifetime he worked the whole of the suitable districts in Kent, and particularly the Wye Downs, where he turned up *Pachetra leucophœa* in some numbers.

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EREbia EPIPHRON, KNOCH: ITS SYNONYMY AND FORMS.

BY H. ROWLAND-BROWN, M.A., F.E.S.

THIS study of *Erebia epiphron* was commenced in 1914, and it had been my intention to complete a monograph of this species. The war intervened when Part I only was finished, and since August, 1914, I have been unable to proceed further. I had hoped, also, to present with Part II at least one or two coloured plates illustrating unfigured forms, but I fear now that, owing to the cost of production, the scheme must be abandoned, though I adhere faithfully to M. Oberthür's formula that verbal descriptions (especially where local and aberrant forms are concerned) should be accompanied by accurate plates, whether coloured or from photographs.

PART I.—SYNONYMY.

Some little time ago I published in the 'Entomologist' (vol. xlv, 1912, pp. 334–336), a few remarks suggested by a question raised by M. Charles Oberthür in his "Lépidoptérologie Comparée" (fasc. iii, pp. 284–288) as to the actual species or forms of one species intended by Knoch and Fabricius in their descriptions of *Erebia epiphron* and *E. cassiope*. The confused and baffling nomenclature of the writers who followed them has provided entomologists with a number of synonymous and specific puzzles, among which the relative values of *Epiphron* and *Cassiope* may be reckoned not the least difficult of solution. But whereas systematists have painfully unravelled the synonymy of other lepidopterous insects, I do not think that the classification of what I will call the *Epiphron* form collectively has been established until quite recently on a complete and satisfactory basis. In this paper, therefore, I shall do my best to determine from the evidence of the authors who have written upon this *Erebia* and its nearly associated allies—

- (i) On what grounds they regarded *Epiphron* and *Cassiope* as distinct species of the same genus.
- (ii) To what extent one should be regarded as a variety of the other.

(iii) How far the varietal name *Cassiope* is permissible for forms of the male of the species in preference to the name of *Epiphron*.

The bibliography of the two butterflies as arranged by (1) Kirby and (2) Staudinger is as follows:

(1) Catalogue of Diurnal Lepidoptera. W. F. Kirby, 1871; Nymphalidae, p. 9, *MANIOLA EPIPHRON*, Knoch (*Pap. E.*), *Beit. Ins. iii, t. 6, f. 1* (1783); *Ereb. E. Herr. Schäff. Schmett. Eur. i, f. 92-94* (1843-1844).

Var. *a*. *Pap. cassiope*, *Fabr. Mant. Ins. ii*, p. 42, n. 417 (1787); *Hüb. Eur. Schmett. i, f. 626-629* (1813?); *Sat. C. Godt. Ene. Méth. ix*, p. 535, n. 154 (1823); *Hipparchia, C. Frey Neuere Beitr. i, t. 20, f. 1, 2* (1831?).

Pap. aleyone, *Borkh. Eur. Schmett. i, p. 96, n. 35b* (1788); *P. egea*, *Borkh. l. c. i, p. 77, n. 16*; *ii, p. 202, n. 16* (1788); *Hipp. E. Frey Neuere Beitr. vi, t. 567, f. 1, 2* (1852?).

Pap. cethiops minor, *Vill. Ent. Linn. ii, p. 37, n. 57* (1789).

Pap. melampus, *Herbst. Naturs. Schmett. viii, p. 186, n. 109* (1796).

Pap. ianthe, *Hüb. Eur. Schmett. i, f. 202* (1800?).

Melampias Rhodia, *Hüb. Verz. bek. Schmett. p. 63, n. 611* (1816).

Var. *b*. *Pap. mnemon*, *Haw. Ent. Trans. i, p. 332* (1812).

Var. *c*. *Ereb. cass. var. Nelamus*, *Boisd. Gen. Ind. Méth. p. 26, n. 195*.

Var. *d*. *E. melampus*, *Newm. Zool. ii, p. 729*, fig. (1844).

(2) Catalog der Lepidopteren Europa's und der angränzenden Lander, O. Staudinger und M. Wocke, 1901.

261. *Epiphron*, Kn. Btr. iii, p. 131, t. 6, f. 7 (1783); O. I. 1, 258; II. S. 92-94; Frr. 544, l. 2; Buckell, Ent. Rec. v, p. 161;

Tutt. Brit. Butt. p. 245; *Egea*, Bkh. i, 77 (1788); Frr. 567, 1, 2*

(fascia maculata extrema rufa, ocellis [♀] albopunctatis). *Hercyn. Siles. Alsat. mont* (*Vogesen*); *Hung. et Bulg. mont.* (*trans.*)).

(a) v. *Cassiope*, F. Mant. 42; Hb. 626-7; O. I. 1. 261; God. ii, 15, l. 2; Frr. 20, 1, 2; Meyer-Dür. Tgf. t. 2, f. 4, 7 (v. *Valesiana*); *Melampus* Esp. 78, 2; Hbst. 209, 7, 8† (mac. ruf. obsoletis, ocellis nigris caecis). *Germ. m.; Helv.*

Gal.; It. s. et c. mont. et Alp.

(b) v. *Mnemon* Hw. Tr. Ent. S. i (1812), p. 332; Buckell, l. c. 161; Tutt, l. c. 427 (al. ant. maculata rufa 4, ocellis 3 nigris caecis, al. post. unicolor, fuscis). *Scot. mont.*

(c) ab. *obsoleta*, Tutt, l. c. 427 (al. omnib. unicolor, fuscis). *Scot. mont.*

(d) v. *Pyrenaica*, H.S. 535-8 (v. 'ocellis magnis'). *Pyr.*

(e) ab. *Nelamus*, B. Gen. p. 26; *Cassiope*, Meyer-Dür. Tgf. t. 2, f. 3 (ab. nigro-ocellata). *Alp.*

* Catalog. 1871; here follows ?*Janthe*, Hb. 202.

† Catalog. 1871 (ad *Epiphronem* refer.?).

‡ Catalog. 1871, major.

The passages in the above underlined do not occur in the earlier editions. In both editions *Rhodia*, Hb., as a synonym for *Cassiope* is ignored, and in that of 1871 neither var. *mnemon* nor ab. *obsoleta* find a place.

The first authentic account of *Erebia epiphron*, then, occurs in Knoch's 'Beitrage,' t. iii, p. 178 (1783), and the description is accompanied by an excellent illustration. Unfortunately the figure (tab. vi, fig. 7) is of one sex only, and one side of it—a female—though the letterpress leaves us entirely in the dark as to which sex the author is defining, or, indeed, whether he differentiated the sexes at all, or had the material before him for the purpose when he wrote. It is, however, essential that we should keep Knoch's original description well before us alike in considering the genesis of the name and the relation of Knoch's *Papilio epiphron* to the *Cassiope* of Fabricius, and of those who followed him. At least there can be no question that Knoch fixed the type, and this from specimens captured by himself in the Brocken region.

"**PAPILIO NYMPHALIS GEMMATUS EPIPHRON.**—Pap. Nymph. Gem. alis rotundatis fuscis, fascia rufa: utrobique ocellis seu maculis nigris pro individuis diversis. Long. lin. 7-8½; lat. 5-5¾.

"*Descr. Antennæ*, 'Pap. Tab.' vi, fig. 7, capitatae nigræ, subtus albescentes. *Palpi, oculi* ac totum corpus fusco-nigra. *Fasciæ transversæ* margines abhorrent. *Alæ superiores* ante ocellis duobus seu pluribus, sæpius maculis tantum vel punctis nigris; *post* eadem ratio. *Inferiores supra* ocellos tres *infra* totidem plures (q)ue seu maculas exhibent."

I translate the German description, which follows, as below:

"The antennæ of the butterfly figured on Plate vi, fig. 7, are long; dirty white beneath; for the rest quite black. The head and its several parts and the entire body are also of that colour. The wings on both sides are black-brown. Not far from the outer margin is a broad, and on the underside a narrower, orange-brown coloured diagonal band, of which the upper and lower parts are not in contact. On the upper side of the former there are in the band two or more black eyes with white pupils. A like number more or less on the underside. On the hind wings there are usually two on the upper side, and beneath a similar or even larger number. I have seen them with six eyes. Some examples, instead of eye-markings, have on one or even on both sides black marks or spots only. When the eye-spots and markings are taken into consideration, variations of this butterfly are found in plenty. Very close to *Papilio ligea*, Esp. ('Esp. Schm.', 1 Th., tab. vii, fig. 2), it is to be distinguished by the broader and darker bands. I have met with one example, the wing of which is 8 lines long and 6 lines broad. Then it is very difficult to find a specimen of *Ligea* which is without pupillations or markings as in our butterfly.

"I found it in a firwood on the way to the Brocken, near Oder-

brück, where it is very common in sunny and open spaces. On the wing in August."

From this description it will be seen that Knoch not only did not regard the white-pupilled ocellation as a specific character of either sex, but actually gave it as his opinion that the commoner form of his *Epiphron* was that with the simple black spots, or points—"saepe maculis tantum vel punctis nigris."

The figure referred to is that of a normal-sized female with white-pupilled ocellations on the bands of both fore and hind wings. Had Knoch, then, figured the male as well, the subsequent confusion of nomenclature might have been avoided. But his immediate successors in entomological literature at all events do not appear to have doubted that the male *Epiphron* resembled the female in this particular respect. Fabricius, for example, writing four years later, accepted the description for both sexes, repeats the account of the species given by Knoch so closely that it is permissible to surmise that he never saw the species alive, and finally introduces to the world his new species *Papilio cassiope* ('Mantissa Ins.', ii, p. 42, 1787), which he places in the group, not next to *Epiphron*, as might be expected, but immediately after his *Pyrrha* (= *Manto*, Esp.); and, there being no figure explanatory of the text, this circumstance is not without significance as we shall presently see.

As I have transcribed Knoch's description of his *Epiphron*, I now append in full Fabricius's account of this and his own species *Cassiope*:

"*EPIPHRON*, 411, P. N. G. Alis integris nigris; fascia rubra; anticis supra ocellis duobus subtus tribus, posticis supra tribus subtus quinque.

"*Papilio Epiphron* Knoch Beytr. 3, tab. 6, fig. 7.

"Habitat in Germaniae montosis, Dom. Bäber.

"Statura omnino et summa affinitas P. *Medusae* at duplo fere minor. Corpus atrum antennis subtus albis. Alae supra nigricantes fascia fulva anticarum imprimis valde abbreviata ocellis duobus approximatis, postice ocellis tribus omnibus pupillatis. Subtus concolores at anticis ocellis tribus, posticis ocellis quinque. Numerus ocellorum alarum anticae variat.

"417. *CASSIOPE*, F. P. N. G. Alis integris fuscis; fascia rufa; punctis tribus ocellaribus nigris, posticis subtus punctis solis.

"Habitat in Austriae Gramine, Dom. Schieffermyler (*sic*).

"Præcedenti affinis" (i. e. *Pyrrha* F.) "at paullo minor. Corpus nigrum. Antennæ subtus pallidae. Alae omnes supra nigrae, fascia marginis haud attingente, in posticis in primis maculari rufa et in hac puncta tria nigra. Subtus anticae concolores, postice punctis tribus at absque fascia rufa."

Again no differentiation of the sexes. But it is, I think, worth mention that in the 'Systematische Beschreibung der

europäischen Schmetterlinge,' published at Halle in the same year as the 'Mantissa' by D. H. Schneider, author of the 'Nomenclator Entomologicus' (Stralsund. 1785), a similar doubt is expressed with regard to the white-pupilled female. Under the title "Papilio Melampus" (pp. 110-111) Schneider refers to Esper's tab. 78, fig. 2, to Knoch's 'Beitrage,' iii, tab. 6, fig. 7, and to Engramelle's 'Papillons d'Europe,' the footnote (89) with the text making it evident that he regarded *Epiphron*, *Melampus*, and perhaps *Cassiope* as of one and the same species, and the white-pupilled form of the female of Knoch's figuring as peculiar to that sex.

"There Herr Knoch not only says that in this butterfly the number of the eye-spots is very variable, but states that the white pupils are often present, and Herr Esper had but a single example. I maintain, therefore, that this butterfly found on the Brocken, and also generally in the mountain regions, is no more than a variety or the female form of our *Melampus*."

From this it would seem as if Schneider also was unacquainted at first hand with the female of either of the three *Erebias* under consideration; for, a little further on (p. 111), commenting on the figures in the 'Papillons d'Europe,' he says, "ist hier eine völlige Binde mit verblichenen Augen gezeichnet, die sich an sämtlichen Exemplaren des Hrn. Esper nicht gefunden haben. Vielleicht eine Eigenschaft des Weibchens?" "Here there is a complete band marked with obsolescent eyes, which we have not found in Esper's kindred examples. Perhaps it is a peculiarity of the female."

A year later, again, Borkhausen is describing the type ('Naturgeschichte Eur. Schmett.,' th. i, p. 77, No. 16, 1788) as *Papilio egea* in what appears to be a mere transcript of Knoch's description. But the following year (*loc. cit.*, th. ii, p. 202) he has evidently discovered that the white-pupilled ocellations are a female character, though, strangely enough, he proceeds to identify Knoch's *Epiphron* (which he re-christens *Papilio alcyone*) with Fuessly's *Melampus* on this ground, and is content to repeat in substance Fabricius's account of *Cassiope* as follows:

"All wings above black-brown with an orange band, which on the fore wings is undivided and does not reach the margins, but which on the hind wings consists of separate blotches and has three black points. On the underside the fore wings are marked as above; the hind wings lack the orange band, but the three black bands are present."*

Why Borkhausen in both cases should have re-named the species is a mystery, the more difficult to comprehend in view of the obvious fact that he had access to both Knoch's and

* Transcribed from "Erebia epiphron and its Named Varieties," by Fras. J. Buckell, M.B., 'Entomologist's Record,' 1894, vol. v, p. 163.

Fabricius's works, and that as yet no question of preoccupied names had arisen to vex the souls of the systematists.

Knoch's 'Beitrage' was published at Leipzig, Johann Christian Fabricius's 'Mantissa' at Copenhagen, Borkhausen's work on European butterflies at Frankfort, and the three authors were contemporaries.

In 1789, however, there was published at Lyons an edition of Linnæus's 'Entomologia, Fauna Suecica descriptionibus aucta, D.D. Scopoli, Geoffroy, de Geer, Fabricii, Schrank, etc.,' under the editorship of Charles de Villers, and here we find *Cassiope* with Engramelle's name—"Le Petit Negre à Bandes Fauves" *Papilio Ethiops minor*.

"57. P.G. (le petit Ethiopien) obscure fuscus, fascia fulva saepius oblitterata, ocellis cæcis, v. *Pap.* d'Eur. t. 24, f. 45.

"Hab. in pratis montium Occitanie."

But, on reference to the figure in Ernst Engramelle's work cited, the butterfly is seen to have white fringes to the wings decidedly suggestive of a small *E. euryale*, and the figure of the underside (45) might well represent that species.

That de Villers enjoyed a personal knowledge of *Epiphron* is more than doubtful; the "montium Occitanie" is vague and negatives any such assumption. Still, he is the first French writer in the field with the Erebias, and for a long time on the word is entirely with the Germans, whose energy and productivity in entomology is the more remarkable when we remember the disturbed state of all northern Europe—Germany included—at this period. Esper's *Ethiops minor*, Illiger,* considered to be a form of *Mnæstra*, and by way of clearing up (!) matters he suggested the name of *Ethiopelus* for it.

The next writer to make the confusion of this group worse confounded is Johann Friedrich Herbst, whose 'Natursystem' and 'Continuation of Buffon's Natural History' was published at Berlin in 1796. Here we have *Epipron* (*sic*) and *Cassiope* (p. 116) separately described and at some distance from one another, clearly indicating the author's view of their respective individuality. But though he places *Cassiope*, as Fabricius did, immediately after *Pyrrha*, it is pretty certain that his *Pyrrha* is not Fabricius's *Pyrrha*, but *Pirene* (= *Stygue*, Ochs.), which he says is an Austrian species, questioning whether it can be truly distinguished from *P. epiphron* (this time spelt correctly). The "præcedente paullo minor" is echoed, none the less, in his "er ist etwas kleiner als der vorige," but either he overlooks or ignores Borkhausen's important sexual differentiation.

For some reason or other neither Kirby nor Standinger appears to have realised that the *Papilio melampus* described in Leonardo de Prunner's 'Lepidoptera Pedemontana,' published at Turin in

1798, is actually *Erebia epiphron*, var. *cassiope*. At all events neither mentions de Prunner's work in this connection. The references he gives, however, and the description of the butterfly, as well as the locality cited, seem conclusive (p. 21) :

"Esper pag. 329, tab. 31, suppl. 7, fig. 2, pag. 131, tab. 78, cont. 28, fig. 2. Alis integerrimis fuscis, primoribus fascia utrinque ferruginea, punctis duobus nigris; posterioribus supra maculis duobus margin-alibus minutis fulvis.

"Bergst. tab. 50, fig. 78, tab. 71, fig. 5-6, tab. 102, fig. 3-4. Engramelle, tab. 24, n. 45 a-b, *le petit nègre à bandes fauves*. Fuesly, pag. 31, n. 604, *Syst. Besch.*, pag. 110, n. 51, *Borkhaus.*, pag. 96-244, n. 356, *Alcyone*.

"Imago in ditione Nice en Provence non rare mense Julio."

On the other hand, Werneburg ('Beitrage zur Schmetterlingskunde,' Erfurt, 1864) had already identified as *Cassiope* Esper's figure on tab. lxxviii, there described as *Melampus*. While it is hardly less doubtful that Esper's two *P. aetherius*, p. 26, F., figured tom. 1, tab. exxii, Cont. 79, figs. 3 and 4, are a male *Epiphron* ab. *nelamus*, Bsdv. (with all the ocellations wanting), and a female var. *Cassiope* respectively. Bergsträsser's figs. 3, 4 on his tab. 102 are also *Cassiope*, as well as Engramelle's *Papilio cassiope*, tab. 24, fig. 45, "aus Steiermark." De Prunner, probably, had no personal acquaintance either with *Melampus* or *Cassiope*; for the latter is included only in the "Elenchus ad cognoscenda lepidopterorum nomina" at the end of his book, this being an index of all the Lepidoptera known to him at the time of writing. All the same the first record of *Cassiope* in what are now the Alpes Maritimes of France must be placed to his credit.

In 1801, or thereabouts, Jacob Huebner figured an *Erebia ianthe* which is criticised by the Graf von Hoffmansegg in Illiger's Magazine, vol. v, p. 181: "Alphabetischen Verzeichnisse von Huebner's Papilionen Durch denselben." This, he says, is *Cassiope* Fab., and "consequently *Cassiope*, Bork." meaning thereby, I suppose, that Borkhausen ought to have called his *Alcyone cassiope*, which he does not.

"Diess ist Cassiope Fab. bei der man jedoch in der Beschreibung den verdrükten text nach dem Art-Kinzeichen und der Mantissa so verbessern muss, das in der 4te und 5te Zeile die Worte *nigra* und *rufa* gegen einander vertauscht werden. Es ist folglich auch *Cassiope* Bork.

"This is Cassiope Fab., in regard to which we must amend the printed text in the description in accordance with the 'Species Insectorum' and the 'Mantissa' so that in the lines 4 and 5 the words *nigra* and *rufa* are transposed."

But Kirby in his 'Catalogue of Diurnal Lepidoptera,' 1871, identifies Herbst's *P. melampus* (*loc. cit.* p. 186) with *Cassiope*.

Our next authority is Ferdinand Ochsenheimer (Leipzig, 1807),

and from the completeness of his observations we may be sure that he had a first-hand knowledge of both *Epiphron* and *Cassiope*, which, none the less, he continues to treat as distinct. Indeed, Freidrich Treitschke, his collaborator, informs us that his colleague had received examples of *Epiphron* from Knoch himself. In the diagnosis of the first-mentioned species ('Schmett. v. Eur.', Bd. i, Abtheil 1, p. 258, No. 41), the white-pupilled ocellation of the female is recorded as a sexual character, and as Dr. Buckell remarks ('Ent. Record,' vol. v, p. 162), we are presented with three new characters: (1) "A greenish gloss on the upper surface; (2) a projection from the centre of the hind margin of the hind wings; (3) the occurrence of a reddish coloration over the disc of the fore wings on the under surface." But Knoch's localities in the Harz are still, it seems, the only known habitat of the species.

Ochsenheimer's account of *Cassiope* is also excellent in detail; and we now hear of it for the first time as a Swiss species. "Alis integris fuscis fascia rufa, punctis tribus nigris; posticis supra maculis rufis nigro-punctatis, subtus feminæ cinerascentibus, punctis solis." Upon which follows an accurate description of both sexes.

Ochsenheimer's and Treitschke's publication covers a long period of years from 1807 to 1835. In vol. x (1834) Treitschke has come to the conclusion that *Epiphron* and *Cassiope* are one and the same species. Fr. Meissner, in the 'Naturwissenschaftlicher Anzeiger der Allegemeiner Schweizerischen Gesel. für Naturwissenschaften,' published at Bern in 1818 (Erster Jahrgang, p. 71), deals with *Cassiope* from the high Alps only, and distinguishes it from *Melampus*, though the remark, "die Unterseite der Hinterflügel ist stets einfarbig braun, ohne alle flecken," leaves us still in some doubt as to the form of the butterfly under his observation.

(To be continued.)

SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

BY F. C. WOODFORDE, B.A., F.E.S.

THE original source of this collection was the presentation to the Oxford University in 1849 by the Rev. F. W. Hope of all his very extensive collections of books, prints and zoological specimens, including that of the British Lepidoptera. This latter he augmented in 1857 by the purchase of the private entomological collection of Mr. J. O. Westwood, and the two were henceforward known as the "Hope-Westwood Collection."

In 1861 Mr. Hope founded and endowed the Hope Professorship of Zoology, and, exercising the right conferred by the Trust Deed, appointed the illustrious Curator, J. O. Westwood, to the Chair. At his death in 1893 he was succeeded by Dr. E. B. Poulton, D.Sc., F.R.S., etc.

The Hope Collections, at first housed in the Taylorian Buildings, were transferred about 1860 to the New University Museum which had just been completed. Thus originated the Hope Department of Zoology, greatly enlarged in 1894 by the addition of rooms formerly used by the Mathematical Professor, and again in 1912 by including the southern part of the old Radcliffe Library.

Later the Rev. F. M. Spilsbury, who died in 1878, left his entomological collection to the Hope Department, and this was combined with the Hope-Westwood Collection.

During the present century very large additions have been made to the entomological collections by bequest and gifts.

In 1906 the extensive British collection formed by J. C. and C. W. Dale was bequeathed by the latter to the Museum with the stipulation that it was to be kept whole and intact and not incorporated with other collections. Detailed notes on this collection were published in the 'Entomologist's Monthly Magazine,' 1907-1910, by Commander J. J. Walker, M.A., R.N.

In 1908 the collections formed by the late Mr. A. J. Chitty were presented unconditionally to the Museum by his widow, and in 1909 that of the late Mr. H. S. Sellon was given, also without condition, by his mother and sisters. In 1915 the collection of the late Mr. Pogson Smith, Fellow of St. John's College, Oxford, was similarly presented by his widow, and in the same year the collection of the late Prof. Meldola, F.R.S., was bequeathed by him to the Museum also without conditions attached. Finally, last year the collection of the late Lieut. R. J. Champion, of Jesus College, Oxford, who was killed in France during the war, was presented by his parents, also unconditionally. Furthermore, large additions have been made by the kindness of many private collectors. All these collections, with the exception of that formed by the Dales, have now been incorporated into one, and are contained in upwards of 500 drawers in more than twenty cabinets.

The specimens of each separate collection are at once identifiable by their labels, so that nothing is lost by incorporation, but on the contrary much is gained by the opportunity of easy comparison with other individuals from other collections. Ample space has been left for future additions, the aim being to represent, as far as possible, each species by a short series of specimens from every locality in its area of distribution in the British Isles.

The classification and nomenclature is that adopted by

South in 'Butterflies and Moths of the British Isles,' except for the Geometræ, for which group L. B. Prout in Seitz's 'Macro-Lepidoptera of the World' has been followed. Before entering upon more detailed description of species and particular specimens it may be observed that with a very few exceptions every species that has occurred in the British Isles is represented in the combined collections. Unfortunately before 1880 very few collectors labelled their specimens and accurate data of most of the specimens in the older collections were wanting, but even in these some of the very rare specimens have good data attached. As an eminent exception mention must be made of the great naturalist, William John Burchell, who, nearly a century ago, labelled his small collection of British Lepidoptera with the same accuracy and minuteness as the specimens in his vast exotic collections, which are also in the Hope Department. Even in the later collections many specimens which would otherwise have been of great value were unlabelled. And here perhaps, as a digression, attention may be called to the importance of accurate and minute data. Many collectors even of the present day seem to consider it sufficient to label their specimens with the locality and the year of capture, but for insects that have more than one generation in a year, the date of the year alone is of no use for the study of the very interesting subject of seasonal dimorphism—the dates of the month and the day of the month are essential. Taking the collection as a whole, however, by far the larger proportion is well furnished with accurate data, labels being attached not only to the insect itself, but a label also being pinned by the side so that the data are clearly legible to the observer. Historically, also, the collection is interesting, there being in the Hope Collection many specimens and some of the types of Haworth, and also some of Doubleday's specimens.

PAPILIONIDÆ.

PAPILIONINÆ.

Papilio machaon.—Twenty-four specimens, mostly from Cambridge fens, but 4 from Norfolk Broads, presented by the late Major R. B. Robertson. Very little noteworthy variation, but one very pale cream, almost white, bred by the late Lieut. R. J. Champion.

P. podalirius.—Two specimens in the Hope Collection, both unlabelled. The following is a quotation from Barrett's 'British Butterflies': "The Rev. F. W. Hope records that he has a specimen which he took at Netley (Shropshire), and also that he had two larvae feeding on wild plum, but it does not appear whether they were reared."

PIERINÆ.

Aporia crataegi.—Forty-three specimens. Five from the Hope Collection, 11 from the Spilsbury, 9 from the Chitty, 10 from the Sellon, all without data. From the Meldola Collection are 8, 5 of which are labelled : 1 "Wales," but no date; and 4 "New Forest, Lyndhurst, 1875."

Pieris brassicæ.—A long series from many localities. A series of eight from the Isle of Wight labelled as a third brood from ova deposited in August, 1898, and as emerging October 13th, 1898. All of these are rather small. No remarkable variation, except that one male has a small black spot on the fore wings corresponding in place with the upper spot on the fore wing of the female. It was bred at Lee, North Devon, May 3rd, 1897, by Prof. Selwyn Image.

P. rapæ.—A long series of upwards of 100 from many localities among them a *quite* spotless male with the usual dark mark at the apex of the fore wings only indicated by a few grey scales, taken at Finchley, April 15th, 1893, by Dr. F. A. Dixey, F.R.S. Another very similar male from North Staffordshire, May 5th, 1917, taken by myself. In both the black spot on the costa of the hind wings is wanting. Several cream or pale buff-coloured females from various localities. A female with a third spot in the fore wings between the usual two, taken by myself in North Staffordshire. Several dwarfs.

P. napi.—A very long and varied series, from England, Scotland and Ireland. A *very* small female in the Sellon Collection taken in the New Forest in July, 1892. Another very slightly larger taken by Mr. Holland near Reading, in July, 1893, and three other dwarf specimens taken by myself in the New Forest. A very heavily marked female with the tips of the fore wings quite black, not grey, the base of the fore wings heavily suffused with grey; the veins of the hind wings pale, inconspicuous except near the edges of the wings, where they are quite black; north Staffordshire, August 7th, 1917, taken by myself. Another very similar from Perthshire, August, 1905, from the Meldola Collection. A long series from many parts of Scotland in which are many fine varieties from the Meldola Collection. A series of four very finely marked specimens from Enniskillen, bred by H. Main, presented by the late A. Harrison. One of the males has a supernumerary spot at the inner angle of the fore wings in the same position as the normal black spot of the female. A dark cream-coloured female from Tyrone.

P. daplidice.—Nine specimens, 4 from the Hope and 3 from the Spilsbury collections, without data. One from the Chitty Collection labelled, "Taken by a labourer near Brighton." Another labelled, "Berks, Ascot. Capt. July, '97, by J. Paterson, a schoolboy. Presented 1900 by H. A. Ormerod."

Euchloë cardamines.—A long series from many localities, but very little variety, except three very small specimens.

Leucophasia sinapis.—A long series of upwards of 100, including many ab. *diniensis*. Two specimens approach very nearly to ab. *crysimi*, having only a very few scattered grey scales at the apex of the fore wing.

Colias hyale.—Upwards of 70, chiefly from Sussex and Kent, but including a fine series of 15 from Oxford taken by Mr. A. H. Hamm. There is also a pale buff-coloured male from the Isle of Wight from the Meldola Collection. In a very remarkable specimen from the Spilsbury Collection, the black border is prolonged to the discal spot in the costal part of the fore wing, and the usual pale marks in the black area are reduced to three small dots in the upper half and a small spot towards the inner angle.

C. edusa.—A long series of upwards of 120, including 24 ab. *helice*. A female taken in Oxford, by Mr. A. H. Hamm, has a very large discal spot, thus approaching the Himalayan *C. fieldii*. A fine lemon-coloured male, taken at Sidmouth in 1872, was presented to the collection by Prof. Poulton. In some of the females the spots in the marginal black area are greatly reduced in size, and in one the spots are practically obsolete.

Gonepteryx rhamni.—A long series without many aberrations. A fine gynandromorph, in which the male colour predominates, has the female coloration in the whole of the left fore wing except the costal portion and in the lower portion of the right hind wing. It was taken near Reading about 1873; presented to the collection by Prof. Poulton. In a short series from the Champion Collection three males have the undersides of a buff colour instead of the normal greenish, while the uppersides are of the usual sulphur colour. Two of the females have the undersides pale buff with upper sides cream-coloured. They were all taken or bred at Woking about 1912. There is also a cream-coloured female with pale buff underside bred at Oxford, August 9th, 1918, by Mr. A. H. Hamm.

NYMPHALIDÆ.

APATURINÆ.

Apatura iris.—A fine series of 34—19 males, 15 females, all but one in perfect condition. Eighteen have full data. Of these 14 are from the New Forest, from the Chitty, Sellon and Meldola Collections. Four are bred from larvæ found near Oxford by Mr. J. Collins. The remainder, which are without data, are from the older Hope and Spilsbury Collections.

NYMPHALINÆ.

Limenitis sibylla.—A series of 58, mostly from the New Forest, but 11 from Berks, 7 from Surrey and 2 from near Oxford. All

are normal except one ab. *nigrina* from the Spilsbury Collection and one intermediate with a portion of the white band clouded with black, from near Reading, taken July 17th, 1919, by the Rev. C. F. Thornewill.

Polygonia c-album.—Series of over 80, without any very remarkable aberrations. There are 7 ab. *hutchinsoni* from Leominster. Much variation is shown in the undersides, from an almost unicolorous very dark brown to the light, well-marked pale brown of ab. *hutchinsoni*.

Eugonia polychloros.—Series of more than 50, with no extreme aberration. A very large specimen from the Champion Collection, taken in the Isle of Wight, August 6th, 1909, has a rather broad black margin to the hind wings adjoining the blue lunules, which are very large and bright.

(To be continued.)

NOTES AND OBSERVATIONS.

VARIETY OF EUCHLOË CARDAMINES.—One out of two pupæ only which I had this year produced a fine ♂, with a conspicuous black discoidal spot on each hind wing, and the spots on the fore wings are unusually large. Although I have specimens, both ♂ and ♀, with black dots more or less developed in the hind wings, I have never seen one approaching this bred specimen as regards these markings.—F. W. FROHAWK.

ASYMMETRICAL VARIETY OF PIERIS NAPI.—The only butterfly seen in my garden on March 29th last, a dull and chilly day, happened to be an asymmetrical specimen of *Pieris napi*, a ♂, very perfect, and apparently only just emerged. The left primary has a large black central spot, which is represented on the right side by a faint dot only; the apical blotch is also less developed than that on the left side, as well as the costal blotch on the secondary. It forms a striking aberration. A precisely similar type of variation exists in a specimen of *P. rapæ* in the Hon. N. Charles Rothschild's collection.—F. W. FROHAWK.

UNUSUAL VARIETY OF AGLAIS URTICÆ.—On May 9th last I captured a very unusual variety of *Aglais urticæ* in my garden (as it sometimes happens the only specimen seen). I noticed as it flew past me it looked somewhat dark; it soon settled on a strawberry blossom, and seeing it was abnormal I fetched my net and captured it. The ground-colour is rich and deep, the normal yellow costal blotches reduced in size, and the outer one almost obliterated by brown scales, the basal blotch clouded with red, the subapical white mark replaced by greyish-buff; the two central black spots are missing except a mere trace of the lower one on each primary, indicated by a few black scales. There is no sign of the usual blue marginal spots on either the primaries or secondaries; the latter wings are unusually dark. The specimen is in such perfect condition

and so rich in colour that it evidently entered into hibernation very soon after its emergence. I may add that it is the only specimen of *Urticæ* seen in the garden during May.—F. W. FROHAWK; June, 1920.

XANTHORHOË FLUCTUATA IN APRIL.—My experience as to the scarcity of insect life up to the middle of May was very similar to that of the Rev. H. D. Ford (*antea*, p. 139), who refers to an extraordinarily early specimen of *Xanthorhoë fluctuata* observed April 25th at Carlisle. I saw a large female of this species on a fence at the Culbin Sands, near Forres, on April 19th.—F. G. WHITTLE; Duneside, Rothiemurchus, Aviemore.

MACEDONIAN BUTTERFLIES.—I see that in my note (*antea*, p. 139) I forgot to mention *Melitæa athalia*. In the list sent me by Mr. Riley, after my specimens were set, he mentioned five specimens of this species as having been included in the Museum collection. Having parted with all my specimens and lost the notes I made out there I cannot give any definite date, but to the best of my recollection I caught them at Hill 778 (between Snevee and Rajanovo) in late July or early August, 1917.—D. BLANCHARD; 16, Warneford Road, Oxford.

[If so, the date suggests *M. parthenie*, gen. *aest.*—H. R.-B.]

SPRING LEPIDOPTERA IN CAMBRIDGE.—With reference to the Rev. H. D. Ford's note (*antea*, p. 139), the following records of spring insects in this district may be of interest. On April 27th two *Pieris brassicae* and one *P. rapæ* were seen. From May 4th *Heliaca tenebrata* and *Chiasmia clathrata* were common, and on that day were seen two *Aglais urticæ* and one *Vanessa io*. *Gonepteryx rhamni* first seen on May 7th, when one specimen of *Hemerophila abruptaria* was taken. From May 9th *Euchloë cardamines* was common, as was *Pararge megæra* from May 16th. *Hesperia malva* and *Nisoniades tages* plentiful from May 22nd. On May 31st *Pyrameis atlanta* and *P. cardui* were seen, and *Cupido minimus* emerged on June 1st.—A. D. HOBSON; Christ's College, Cambridge.

SPRING INSECTS IN BERKSHIRE.—My experience with insects this spring has been rather different from those of the Rev. H. D. Ford ('Entom.', liii, p. 139). As far as Rhopalocera were concerned it seemed to me that they were more plentiful than usual. *Aglais urticæ* and *Gonepteryx rhamni* were first seen on March 19th, and have been much in evidence since. Already I think I have seen more specimens of *Vanessa io* and *Pyrameis atlanta* than during the whole of last season. There has been no dearth of *Pieris* and *Callophrys rubi*, and *Euchloë cardamines* were very common on Aldworth Downs during the middle and latter part of May. In early June *Hepialus humuli* was in swarms in the water meadows along the Kennet. The same remark also applies to *Calopteryx splendens* (Odonata).—A. STEVEN CORBET; 21, Sidmouth Street, Reading.

SPRING INSECTS AT DOVERCOURT.—The three common Pierids have been numerous. I saw *Pieris brassicae* on March 20th—an unusually early date. These abnormal appearances, both of this

species and of *P. rapæ*, are due to their larvæ having changed to chrysalids in some warm window corner, where the sun's rays shone upon them, so that they were more or less forced. I did not see *P. rapæ* until two days later, and the first *Celastrina argiolus* was observed the same day, flying about some ivy in my garden. I have not seen another, and it is generally plentiful here, particularly the second brood. The first *Euchloë cardamines* was noted on May 9th, and I daresay I should have seen it before if I had been able to visit its haunts. On May 22nd I counted ten males in the lane when I released some North Devon bred examples last year. *Pararge megæra* was out in some numbers at the same time, and also one or two *Polyommatus icarus*. On May 26th, while passing through a yard, I saw a *P. brassicæ*, that had only just emerged from its chrysalis on an adjacent wall, flutter down in front of three hens. They just looked at it, but made no attempt to seize it. I have previously observed that poultry will not touch white butterflies, or the larvæ of *brassicæ*. They are evidently distasteful to them. *Cœonympha pamphilus* was out in numbers by the middle of May. Hibernating Vanessids have been very scarce. I have only seen two *Aglais urticæ* and eight *Vanessa io* since March 19th, and there are no nests of larvæ yet to be seen on the nettles. With regard to moths I cannot say much, as I have not been to the woods, nor do I go out at night. But the larvæ of *Arctia villica* have been rather numerous. I saw the first on March 19th, and the last on April 30th. I took 180 of them altogether on the chance of breeding varieties. The first moth appeared on May 27th, and up to the present date I have bred 125, and among them are several very nice examples of my ab. *wardi* (*vide* 'Entom.', xlvi, pp. 41–42) and other varieties finer, I think, than any I have bred before. Of course all typical specimens were given their liberty. June 2nd was very warm, and after breakfast I went to the sea bank to release some that had emerged the previous day. Soon after I got there I saw two *villlica* flying wildly about in the hot sun, and one of them was ab. *wardi*. I had no net, but managed to knock it down with the palm of my hand as it fluttered over the coarse grass. I was then able to box it, but unfortunately it was not a very good specimen. *Euclidia mi* was flying in great profusion, and appeared to be fine and fresh. *Cœonympha pamphilus* was flying everywhere with *Pararge megæra*. The temperature this day was 73° in the shade. Two days after, June 4th, at 8 a.m. the thermometer stood at 48°, and it did not rise higher than 53° all day, or 20° degrees lower than on the 2nd. I went to the same place again in the forenoon to release more *villlica*, and there was not an insect flying. I only saw one *C. pamphilus*, which I brushed off the grass as I walked through it.—GERVASE F. MATHEW; Dovercourt, Essex, June 9th, 1920.

HIBERNATION OF PYRAMEIS ATALANTA.—In reference to this question my own experience is undoubtedly in favour of its doing so. In January, 1909 (January 27th, I think), I saw some men demolishing an old wood-stack at Lydiard Park, and they called my attention to a number of "dead" butterflies they were finding there. The species were *urticæ* and *io*, at least a dozen of each, but I was

chiefly impressed by finding two *atalanta*. It was freezing hard at the time, so it was no wonder that the insects seemed dead. I also remember when a boy at Ludgvan, Cornwall, a wood-stack was pulled down in the winter for firewood, and we children were greatly interested in the butterflies found therein. I am sure that there were several *atalanta* among them, and I was even then much interested in butterflies, and knew most of the ordinary species quite well. At any rate I know that owing to this experience I never had any doubt about the hibernation of the Red Admiral until in later years I found it denied by most authorities. I saw an *atalanta* on April 16th, 1919—surely not an immigrant.—J. PERCY HARRISON; Lydiard Millicent Rectory, Swindon.

[In the 'Entomologist,' February, 1913, vol. xlvi, pp. 40-42, I was able to place on record for the first time authentic instances of the actual finding of *P. atlanta* hibernating. Three specimens were found by Mr. Walter Barnes at Orpington, Kent. The first one was discovered by him clinging to the woodwork under the slates on his house, together with two *Vanessa io* and two *Aglais urticae*, in February, 1907. In January, 1908, he found another *atlanta* in a holly hedge; it was resting on a dead leaf under a thick covering of a mass of withered leaves in the centre of the hedge, which also contained three *Gonepteryx rhamni* hibernating. The third *atlanta* he found the following November under the eaves of his house. As there are but few cases of *atlanta* being found in a hibernating state the above note by the Rev. J. Percy Harrison is particularly interesting.—F. W. FROHAWK; June, 1920.]

UNUSUAL IMMIGRATION OF PYRAMEIS ATALANTA AND *P. cardui*.—During May a great immigration of both *Pyrameis atlanta* and *P. cardui* seems to have been general throughout the south-eastern and southern counties. I saw the first *P. atlanta* on May 14th in my garden here—S.E. Essex—and several *P. cardui* made their appearance on May 22nd. The large number which have occurred here and elsewhere denotes a great and general immigration has taken place, far in excess of anything of the kind I have known to occur. I have also heard of *Colias edusa* having been seen in different places. I may add that both *Pieris brassicae* and *P. rapae* have been unusually abundant here, the result of immigration.—F. W. FROHAWK; June, 1920.

PYRAMEIS CARDUI IN MAY.—On p. 80 of your 'Butterflies of the British Isles' you say that specimens of *P. cardui* seen in the spring are early immigrants. On May 11th I took a specimen in a wood near Oxford which was so fresh that it could not have been out more than a few hours and certainly could not have been an immigrant.—E. BOLTON KING; Balliol College, Oxford.

PYRAMEIS CARDUI, ATALANTA, ETC., IN MAY.—I saw several specimens of *P. cardui* in this neighbourhood on May 22nd and 23rd, as well as two specimens of *P. atlanta*. Both species were very faded. I am glad to be able to record that *Pararge megæra* is very plentiful at present. I saw very few last summer, and in the Chandler's Ford neighbourhood it has been very scarce for years. Up to the

present all the common species of butterflies seem very abundant this season.—Lieut.-Comm. R. A. DICKSON, R.N.; The Hermitage, Bishop's Waltham, Hampshire.

PYRAMEIS ATALANTA IN MAY.—On May 24th I saw a specimen of *Pyrameis atlanta* flying in my garden, and this was not the first occasion, but I forget the previous date. Such an early appearance seems suggestive of its having hibernated in England rather than that it should have migrated here from the Continent.—W. M. CHRISTY; Watergate, Emsworth, Hants.

HIBERNATION OF AGLAIS URTICÆ.—With reference to the recent notes in this Journal on the hibernation of *Aglais urticae*, I should like to add that it has long been known that *urticae* frequently hibernates very shortly, probably during its first flight, after emergence from the pupa about mid-summer. A very interesting note regarding this habit is recorded by the Rev. O. P. Cambridge in the 'Entomologist,' dating as far back as 1867, stating: "On one of the first Sundays in August last, during divine service, a specimen of *Vanessa urticae* flew into the parish church of Winterbourne-Tomson, in which I was officiating. After fluttering in the windows and flying about the church for a short time, the insect settled on a projecting rafter in a conspicuous place, and remained, with its wings in the usual state of repose, during the remainder of the service. On the Sunday following it was still *in statu quo*; and so, Sunday after Sunday, throughout the autumn and winter, evidently never having once moved from its first position. There it was until, on Sunday, the 5th instant, it came off its perch, and was flying briskly about the church when I came away after the conclusion of the service. Its period of motionless repose has thus been just nine months, and it was apparently as fresh in colour and condition as if just out of the chrysalis.—O. P. Cambridge; Bloxworth, May 22nd, 1867." I have noticed this species entering into hibernation as early as July on more than one occasion. In 1918, towards the end of July, I found a specimen which had taken up its winter quarters by a skylight in my house, where it remained until the following spring, when it left the spot and flew away during a short warm spell of weather on April 19th, 1919, the duration of its winter's sleep being nine months, similar to the one under the Rev. O. P. Cambridge's observation. Last autumn *urticae* was scarcer than I have ever known it. I did not see more than half a dozen specimens from the end of July onwards, and the hibernated individuals have been equally rare in this district—S.E. Essex. On March 28th I saw two in the garden here and one or two during April; on May 9th one only, which, however, turned out to be a nice variety—recorded in a separate note. The Vanessidae have a habit of congregating for hibernation—not only individuals of the same species, but the different kinds have from time to time been found assembled in the same shelter. Instances are recorded of large numbers of *V. io* having been found together. Mr. A. B. Farn once found a large colony of these butterflies in a hole in the trunk of a tree; thinking it might be a likely place for hibernating butterflies he looked in, when he heard a hissing sound caused by the large number of speci-

mens rubbing their wings together—a habit peculiar to the Vanessidæ. Over forty *V. io* were found by the late Edward Newman hibernating in a hollow oak. Several other cases of a similar kind have been observed. Faggot-stacks appear favourite hibernating resorts for the different species—in fact all the species have been found in faggots stacked up for the winter, including *Euvanessa antiopa*; a specimen of this rarity I have in my series which was found crawling out of some burning faggots at Castle Eden on February 8th, 1869. I know of many instances of *polychloros*, *urticæ* and *io*, also a case of *atalanta*, all hibernating in stacks of wood.—F. W. FROHAWK; June, 1920.

DEILEPHILA LIVORNICA, ETC., IN DEVONSHIRE.—*D. livornica* occurred in this district during the latter half of May. I netted one on the 15th of the month and subsequently saw several others. *Pyrameis cardui* has been plentiful since May 13th, and I saw two specimens of *Colias edusa* near Brixham on May 22nd.—E. D. MORGAN; 27, Sanford Crescent, Cheston, Torquay.

DEILEPHILA LIVORNICA IN SUSSEX.—On May 23rd last I took a specimen of *D. livornica* at Elsted, Sussex. It was hovering over blossoms of red campion.—E. B. HAYNES; 25, Denmark Avenue, Wimbledon, S.W. 19.

COCCINELLIDÆ WANTED.—Coccinellidae, dead or alive, are greatly needed from various parts of England, Scotland and Wales for the purpose of studying the distribution of species and varieties. Will collectors kindly send surplus specimens of *any species, however common*, to Mrs. O. A. MERRITT HAWKES, M.Sc.; 405, Hagley Road, Birmingham.

SOUTH-EASTERN UNION OF SCIENTIFIC SOCIETIES.—This Union has held its annual congress uninterruptedly since its inception, just a quarter of a century ago, and although owing to the stress of war conditions, the last three have been held in London, it this year resumed its nomadic traditions, and the twenty-fifth congress was held at Eastbourne from June 2nd to June 5th, when a goodly number of delegates and members attended. Considering the large number of subjects that come within the Union's activities, entomology had a fair share of attention. On the afternoon of the opening day a party of between thirty and forty "devotees of the net and pin" attended a "ramble" along the parades and lower portions of the Downs under Beachy Head, the haunts of many of the local species being visited, and in several cases the species themselves being met with. On their return the party were entertained to tea by Mr. and Mrs. R. Adkin, at "Hodeslea," formerly the residence of the late Prof. Huxley, much interest being taken by the visitors in the historic house and grounds. On Friday evening Prof. Poulton, F.R.S., gave an illustrated lecture on "Recent Discoveries in Insect Mimicry" to a large and appreciative audience. On Saturday morning the report of the "Mosquito Investigation Committee" was presented and discussed, and the business of the Congress was brought to a close by the reading of a paper by Mr. Robert Adkin, F.E.S., on "Migrations of Lepidoptera in regard to the British Islands," at which Prof.

Poulton occupied the chair; the paper was illustrated by exhibits of many of the species referred to and by maps and diagrams, and was followed by a discussion.* The press of business at recent congresses has been so great that it has been found necessary to hold sectional meetings for some of the more important subjects; among these a Botanical Section has been in existence for some time past, and it is now proposed to found a Zoological Section in which entomology will no doubt hold a leading part. It is proposed to hold the next Congress at Reading in June, 1921, Prof. Poulton, F.R.S., being President-elect.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, March 17th, 1920.—Comm. J. J. Walker, M.A., R.N., F.L.S., President, in the Chair.—Messrs. Christopher Arthington Cheetham, Wheatfield, Old Farnley, Leeds; G. S. Cotterell, Newlyn, Gerrard's Cross; Harry Leon Gauntlett, F.Z.S., M.R.C.S., L.R.C.P., A.K.C., 45, Hotham Road, Putney, S.W. 15; Thomas Frederic Marriner, 2, Brunswick Street, Carlisle; C. Smee, 6, Wildwood Road, Golders Green, N.W. 4; and Dr. B. Uvaroff, the Georgian Museum, Tiflis, Transcaucasia, were elected Fellows of the Society.—Prof. Poulton, F.R.S., exhibited, on behalf of Mr. F. C. Woodforde, the following varieties from the collection of British insects in the Hope Department at Oxford: (1) *Chrysophanus phœas*, L., ab. *schmidii*, Gerh., Burnt Woods, Market Drayton, N. Staffs.: September 8th, 1917. F. C. Woodforde. (2) A variety of the same species with the coppery area of the fore wing replaced by a smoky ochreous. The same locality: August 5th, 1918. H. F. Onions. (3) The var. *eleus*, F., of the same species, Milford, Surrey; July 29th, 1908. From the collection of the late Lieut. R. J. Champion, (4) *Celastrina argiolus*, L., var., with radiate spots on the hind wing underside, the fore wing spotless. Near Ashurst Lodge, New Forest: May 8th, 1915. F. C. Woodforde. This variety approaches the ab. *subtus-radiata*, Oberth., taken at Rennes. (5) *Catocala nupta*, L., var. with the red of the hind wings replaced by a dark maroon colour. Taken at light, Guildford: September 2nd, 1907. From coll. R. J. Champion.—Prof. Poulton exhibited a series of six examples of *Beris vallata*, Forst., captured with the following Tenthredinidæ—2 ♀ *Dolerus aericeps*, Th., 1 ♂ *Selandria serva*, F., 4 ♂ *Athalia lineolata*, Lep., by Mr. A. H. Hamm, on July 13th, 1907. All thirteen insects were taken from flowers, chiefly Umbelliferæ, growing over a small area of Hogley Bog, Cowley, near Oxford. The first-named sawfly was far less perfect as a model than the other two, the last-named being the most perfect.—Major H. C. Gunton exhibited a diagram referring to Macro-lepidoptera of the 1919 season in order to suggest a graphical method of recording observations of the appearance and habits of

* During the Congress a loan exhibition was on view, the portion of which devoted to entomology included many interesting local species, among them being examples of *Pieris daplidice*, *Sphinx conroluli*, *Tortrix pronubana*, etc., taken in the neighbourhood of Eastbourne.

insects in relation to weather conditions. A copy of the diagram can be seen at the Society's Library.—Dr. G. D. H. Carpenter said that since many naturalists believe that birds do not eat butterflies no ease of such an occurrence should be left unrecorded; on February 15th of this year, about mid-day, he saw a male Brimstone Butterfly fly through the garden at Oxford, and three sparrows that were on the ground leapt into the air, and, fluttering clumsily, attempted to catch it; the butterfly easily evaded the birds.—Mr. H. Main exhibited lantern-slides illustrating the life-history of the Beetles *Copris lunaris*, *Onthophagus vacca*, and *Necrophorus humator*.—The following papers were read: "A Contribution to our Knowledge of the Life-history of the Stick Insect, *Carausius morosus*, Br." by George Talbot, F.E.S.; "A Record of Insect Migration in Tropical America," by C. B. Williams, M.A., F.E.S.; "The Geographical Factor in Mimicry," by F. A. Dixey, M.A., M.D., F.R.S., etc.—G. C. WHEELER, Hon. Sec.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—April 22nd, 1920.—Mr. K. G. Blair, B.Sc., F.E.S., President, in the Chair.—Mr. S. Edwards exhibited *Tenoris honrathi* from Java and *T. selene* from N. Guinea, *Dynastor napoleon* from S. America, and several species of *Opsiphantes*.—Mr. Newman, the pale Cheltenham form of *Gonodontis bidentata*, unusually large *Tephrosia luridata*, curiously radiated forms of *T. bistortata*, and varied series of *Hydriomena impluviata*, *H. fureata*, etc.—Mr. Hy. J. Turner, a copy of Moufet's 'Insectorum sive Minimorum Animalium, Theatrum,' 1634, and numerous species of the genus *Plusia*.—Mr. B. S. Williams, *Rumicia phleas*, heavily spotted, dusky, with pear-shaped spots, ab. Kochi, with dark nervures with wide borders, etc., all from Finchley in 1911 chiefly—a hot season.—Capt. Crocker, a collection of Lepidoptera representative of what he had met with in the battle-fields of N.W. France chiefly in 1919, including *Issoria lathonia*, *Melitaea cinxia* from a very wet marsh, *Nordmannia ilicis*, *Colias hyale*, etc. Among the moths were *Aglaja tau*, *Lymantria dispar*, *Notodonta tritophus*, *Scopulon tabaniformis*, bred from poplar stumps, *Senta maritima* in great variety, etc.—Various notes on the season were communicated.

May 13th, 1920.—The President in the Chair.—Exhibition of orders other than Lepidoptera.—Mr. Stanley Edwards exhibited a collection of exotic Coleoptera and Orthoptera.—Mr. S. R. Ashby, British ground-beetles, Lamellicornes, Buprestids, Elaterids and many Weevils from his collection.—Mr. Barnett, part of a gate-post excavated by a leaf-cutter bee, one cavity containing fifteen cells; an exceptionally brilliantly marked young viper; and the body of a large lizard taken from the stomach of another viper.—Mr. Cocks, Coleoptera characteristic of the Wellington College area, including the fire-beetle *Melanophila acuminata*, which was quite abundant there.—Mr. H. Moore, many species of Orthoptera collected by Mr. Grosvenor near Bangalore, India, and read notes on the exhibit.—Mr. West, four drawers of his collection of British Hemiptera.—Mr. Step, the weevil, *Baliinus nucum*, from Wimbledon.—Mr. H. W. Andrews, many species of British Diptera showing wing-pattern and coloration, and reac-

notes on the exhibit.—Mr. Main, examples of various species of Mosquito and a series of preserved larvae of the same, with a cage which he had made for breeding mosquitoes.—Mr. Dennis, on behalf of Mr. R. S. Bagnall, species of *Protura* and *Sympyla* shown under the microscope.—*Hy. J. TURNER, Hon. Editor of Proceedings.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meetings held at the Royal Institution, Colquitt Street, Liverpool.—*February 16th, 1920.*—Mr. S. P. Doudney, President, in the Chair.—The evening was chiefly devoted to a discussion of the rules of the Society.—Exhibits were as follows: By Mr. S. Gordon Smith, a case of very fine varieties of *Vanessa io*, *V. urticae*, *V. polychloros*, *Apatura iris*, *Epinephile hyperanthes*, and *Arctia caia*, many being from the collection of the late Sydney Webb.—Mr. W. Mansbridge showed a long series of *Leptogramma literana* and varieties from the New Forest and a series of *Elachista magnifica* from near Prescot.

March 15th, 1920.—The President in the Chair.—Mr. F. N. Pierce read a paper entitled, "Notes on American Tortrices." In his interesting communication Mr. Pierce described the affinities of a small collection of North American Tortricidae with certain British species, as shown by their genitalia, and exhibited the specimens. If there were any longer doubt as to the value of the genital ancillaries in questions of relationship it would be dispelled by the facts brought forward in the paper. Mr. Pierce conclusively demonstrated that generic as well as specific limits could be recognised by a study of this branch of insect morphology. An animated discussion followed the paper.—Spring Lepidoptera were exhibited by Messrs P. J. Rimmer, W. A. Tyerman and the Rev. F. M. B. Carr. It was noted that melanism in *Phigalia pedaria* and *Hybernia leucophæaria* seemed to be more marked at Delamere and Eastham than usual.—Mr. Wm. Mansbridge brought some curious short-winged specimens of *Canonympha pamphilus* and *Selenia bilunaria* from Grange and Torquay respectively.

April 19th, 1920.—Meeting held at the Liverpool School of Tropical Medicine.—Mr. S. P. Doudney, President, in the Chair.—Prof. Leonard Doncaster, D.Sc., F.R.S., was elected a member of the Society.—Robert Newstead, Esq., M.Sc., F.R.S., Professor of Entomology in the Liverpool University, welcomed the members to the School of Tropical Medicine, and gave a short account of its history and objects. The new buildings have only recently been entered; during the war they were used as a military hospital. Full suites of rooms and laboratories are arranged for the requirements of each subject—tropical medicine, entomology and parasitology—with a staff of professors and assistants highly qualified for the special work of the School. The building includes a museum and lecture theatre. The efficiency and completeness of the School was rendered possible by the foresight and liberality of the late Sir A. L. Jones, who fully recognised its value to the Empire. Prof. Newstead and his assistants then showed the members of the Society over the building, and made the following special exhibits: Mosquitoes—(a) *Stegomyia fasciata*, a culicine mosquito responsible for the transmission of yellow fever. Examples of the fly were shown and a case

illustrating phases in the life-history of the species. (b) *Anopheles maculipennis* and other anopheline mosquitoes concerned in the spread of malaria. (c) Living larvae of the rot-hole breeding mosquitoes, *Anopheles plumbeus* and *Ochlerotatus geniculatus*, which had been taken from the water in rot-holes in trees at Aigburth and other districts near Liverpool. Tsetse-flies: A large collection containing all the known species of *Glossina* was on view. The most important species are *Glossina palpalis*, chiefly responsible for the transmission of sleeping-sickness, and *G. morsitans*, which spreads trypanosomiasis among horses and cattle. Acarids affecting flour: Specimens of the acarid *Aleurobius farinosae* and samples of flour in various stages of deterioration owing to infestation with this mite. Plague fleas: Specimens of the Indian plague flea, *Xenopsylla cheopis*, and the common rat flea of temperate countries, *Ceratophyllus fasciatus*, were shown. Tabanidae: A collection of blood-sucking flies of the family *Tabanidae*, chiefly African species, was on view.—Mm. MANSBRIDGE, Hon. Sec.

THE ENTOMOLOGICAL SECTION OF THE NORTHUMBERLAND AND DURHAM NATURAL HISTORY SOCIETY.—April 9th.—Dr. F. G. Garret, President, in the Chair.—Mr. Bagnall showed and described slides of Thysanoptera and other obscure groups.—The Messrs. Rosie beautiful sets of local Diptera, Micro-lepidoptera and preserved larvae.—Mr. J. Baxter, a fine *Euvanessa antiope* with its marginal yellow band heavily speckled with black, caught by himself at the Black Hall Rocks, also a series of *Vanessa io* which after an absence of forty years has occurred every year since 1911 in the Team Valley.—Major Gardner exhibited recently captured local forms of *Phigalia pedaria* and *Hybernia leucophoearia* showing its full range of variation.—Dr. J. W. H. Harrison brought for exhibition and discussion fine series of various hybrids, including many new ones; likewise a black *Selenia bilunaria*, a brown black example of the same, a gynandromorphous *Operabia autumnata* (right side male, left female), and some remarkable aberrations of *O. dilutata*, a pure black form, the ordinary grey form with all markings inward from the subterminal line obsolete, a black form with a silvery central band which abounds in a wood near Lamesley, and the variety *latifasciata*. He also showed a fine *Pieris napi* var. *flavescens* from Forres and some *Tephrosia histortata* of the single-brooded local form which, reared at 80° C., approximated closely to the other species, *T. crepuscularia*. Various members joined in the discussion and gave their experiences of the past season.

THE LONDON NATURAL HISTORY SOCIETY now meets in Hall 40, Winchester House, Old Broad Street, E.C. 2. Full Society meetings are held on the first Tuesday in the month, and Sectional meetings on the third Tuesday at 6.30 p.m. (No meetings in July and August.) Visitors welcomed at all meetings.—W. E. GLEGG, 44, Belfast Road, N. 16, Hon. Sec.

RECENT LITERATURE.

Zoology: A Text-book for Colleges and Universities. By Prof. T. D. A. COCKERELL. Pp. xiii + 558. New York: World Book Company.

THIS handy and very well-illustrated volume forms a welcome departure from the average "text-book of zoology" with which one is familiar. It contains upwards of two hundred excellent text-figures, most of which are original. The title is perhaps a little misleading; it might perhaps have been described better as "An Introduction to the Study of Zoology." Approximately half the volume is devoted to a systematic survey of the classes and orders of living animals, accurate, but not too elaborately detailed even for a beginner. The author has succeeded very well in these chapters in presenting the necessary facts and conclusions in a fresh and readable manner, quite escaping from the deadening system of enumeration of multitudinous details, than which little can prove more disheartening to most students. It is pleasing to find in this section of the book a larger part than usual devoted to insects. Entomologists are too frequently regarded with a kind of tolerant scorn by the "zoologist" who does not study insects, yet entomology affords a readier ground for the study of many of the most fascinating problems of modern zoology than does the study of almost any other large class of animals. In addition it is hardly necessary to mention the immense importance to man of the work now being done by entomologists in all parts of the world, and to hope that the treatment of this subject in the present volume is an indication that entomology is at last about to come into its own.

The remainder of the book is devoted to chapters on heredity, variation, sex, natural selection, evolution, disease, eugenics, sociology, distribution, etc., and also includes several sketches of the lives of the fathers of zoology. Necessarily the author has been able only very briefly to outline these subjects in the space allotted, yet the information is as full as possible and accurate, and is quite sufficient to stimulate interest and to show the importance of these problems and their intimate connection with everyday life. The inclusion of the more important references to more important works on special subjects is a sound point and of much value to the student. The book provides a very useful summary of the present state of zoology, and should prove a very useful and handy work for both the student and the "man in the street" who wants to know what zoology is.

N. D. R.

Catalogue of the Lepidoptera Phalænæ in the British Museum. Supplement. By Sir GEORGE F. HAMPSOM, Bart. Vol. ii, pp. i-xxiii and 1-619. London: Printed by order of the Trustees, 1920.

As the genus *Lithosia*, Fabr., is older by some fourteen years than *Arctia*, Schrank, the Family Arctiadæ of vol. iii (1901) becomes Lithosiadæ in this supplementary volume.

Present knowledge of the Aretiana of the world embraces 2060 species, and of these no less than 1215 are brought forward in the work before us. The number of genera in the subfamily is here increased by 25, thus giving a grand total of 172.

Eighty species are added to the Phalaenoididae (= Agaristidae, vol. iii) and 7 new genera are introduced, the present number of genera and species in this family now being 60 and 305 respectively.

Over 100 species, with structural details, are figured in the text, and we gather from the Preface that the plates in connection with this volume are numbered xlvi lxxi. We have not seen the latter.

A Monograph of the British Orthoptera. By WILLIAM JOHN LUCAS, B.A., F.E.S. Pp. i xii + 1 261. London: The Ray Society, 1920.

The Ray Society as publishers, and Mr. Lucas as author, are to be congratulated on the highly successful manner in which this volume has been produced. The author has performed the somewhat laborious task of bringing together all that is at present known concerning members of the Orthoptera occurring in the British Isles. Hitherto the insects belonging to the group have received but scant attention from the majority of entomologists in our islands. We may reasonably hope, however, that with the advent of this important work, as guide and mentor, our orthopterous fauna will henceforth receive the recognition of which it is in every way worthy.

Rejecting all accidental or occasional visitors that are reported as having been detected in Britain, some 46 species in all, Mr. Lucas deals with 39 species of Orthoptera as British. Of this number several are not really indigenous, but may be regarded as well-established colonists.

These 39 species, representing 28 genera, are considered under five suborders as follows: (1) Forficulodea (Earwigs), 7 species; (2) Blattodea (Cockroaches), 8 species; (3) Gryllodea (Crickets), 4 species; (4) Locustodea (Long-horned Grasshoppers), 9 species; (5) Acridiodea (Short-horned Grasshoppers), 11 species.

The original description, we are pleased to note, is given of each species. Both sexes are then described in the vernacular, followed by notes on the earlier stages, remarks on variation, times of appearance, habits and distribution.

All the species are figured on the plates, of which there are twenty-five, and there are twenty-five figures in the text. Nearly all these illustrations are reproductions of drawings or photographs by the author.

Although some changes in nomenclature are made, students of the group will not experience much to perplex them in this matter.

There can be little doubt that when greater interest is taken in the Orthoptera by entomologists, it will be found that some, especially the commoner species, have a more general distribution throughout our islands than they would appear to have from the records up to date. Again, more information would accrue on the important matters of habits and life-histories.

THE ENTOMOLOGIST.

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[No. 687]

DESCRIPTION OF A NEW SPECIES OF NEOTROPICAL CICADIDÆ.

By W. L. DISTANT.

THIS species, presented to the British Museum by Lady Bute, was collected by her son, the Earl of Dumfries, who captured it while travelling across the Andes on the Argentine side. It flew into the railway carriage in which he was seated. Two specimens were thus obtained.

Tettigades dumfriesi, sp. n.

Body black; margins before central lobe to head, narrow anterior margin, anterior lateral margins and posterior margin to pronotum, two central angulate, discal spots and broad posterior margins to mesonotum ochraceous; abdomen above sparingly, greyishly longly pilose, the segmental margins narrowly, somewhat obscurely dark dull ochraceous, abdomen beneath more longly greyishly pilose; tegmina and wings hyaline, the venation black, the first with the costal membrane, the basal cell, the apical transverse vein to radial area, the inner margin to lower ulnar area, inner margin to claval area, and a small spot near bases of longitudinal veins to first, second and third ulnar areas and a similar spot near apex of upper vein to fifth ulnar area, pale dull ochraceous, wings with greyish marginal streaks to the veins on about basal half; face broadly centrally longitudinally channelled.

Long. excl. tegm. 21, exp. tegm. 58 mm.

Hab.—Argentine side of the Andes, about 6000 ft. above sea-level.

Allied to *T. lebruni*, Dist., from Patagonia, and *T. parva*, Dist., from the Argentine, but differing from both those species by its larger size, longer and narrower lower apical area to tegmina, which is more than twice as long as broad, and the broadly, centrally, longitudinally channelled face.

A THEREVID FLY IN BURMESE AMBER.

By T. D. A. COCKERELL.

IN a new lot of Burmese amber recently received from Mr. Swinhoe is a small species of the Dipterous family ENTOM.—AUGUST, 1920.

Therevidae. The family is new to Burmese amber, but is known from Baltic amber and from the Florissant miocene. So far as can be seen, the species may go in the genus *Psilocephala*, where it is remarkable for the small size, broad wings, and strongly diverging sides of the second posterior cell. It may be called *P. electrella*.

Psilocephala electrella, n. sp.

Thorax and abdomen dark brown, bared (probably black in life); wings not over 4·3 mm. long, very broad, hyaline, with brown veins, the end of the subcostal cell clouded as usual. Compared with Verrall's figure of the wing of *Thereva annulata*, Fab., the following differences are found: Wing considerably broader, with the apex more obtuse; auxiliary vein with a distinct double curve, so that it approaches the first longitudinal subapically, and then curves upward; second submarginal cell narrower, scarcely going below the apex of wing, the section of the margin it encloses presenting only a slight even curve (instead of a conspicuous bend); anterior cross-vein very distinctly before middle of discal cell; second posterior cell much more widely open, its sides diverging.

ENTOMOLOGY IN THE HOLY LAND.

BY CAPT. P. J. BARRAUD, F.Z.S., F.E.S.

Whilst serving as Entomologist to the Egyptian Expeditionary Force since the end of June, 1919, my time has been largely occupied with malarial surveys, the collection and identification of mosquitoes, and the supervision of anti-malarial work. This has given me opportunities of visiting most parts of Palestine and of making small collections of other insects at odd times.

In this series of papers I propose to place on record my general notes on the insect fauna of Palestine. I have included a few records obtained while on a somewhat rapid tour through Syria and Cilicia in September and October last. The Culicidae will be dealt with elsewhere separately.

I am indebted to a number of friends at home who from time to time have been kind enough to examine specimens I have sent, and to furnish identifications as far as possible. I wish to specially thank Dr. Guy Marshall, Mr. H. Rowland-Brown, Mr. L. B. Prout, Mr. George Talbot and Mr. Herbert Campion for their valuable assistance.

A brief description of the physical features and climate of Palestine is necessary.

The country is divided into several distinct regions.

Firstly, the coastal belt, a more or less rich tract of grain lands and orange groves, varying in width from a few yards

where the mountains approach the sea, to many miles where they recede. Many towns and villages lie along this plain, the chief of which are Gaza, Jaffa, Haifa, and Acre.

Secondly, the central mountain chain of barren limestone, rising steeply from the plain, here and there attaining a height of from 2000 to 3000 ft. This is made up, from north to south, of the Galilean hills, the mountains of Samaria, and the mountains of Judæa. The Mount Carmel range lies in a lateral direction, approaching the sea westward of Haifa. Upon the central range are situated the towns of Safed, Nazareth, Samaria, Nablus, Jerusalem and Hebron. Southward from Hebron the mountains sink into the plains around Beersheba.

Thirdly, the Jordan Valley, a stupendous and unique "fault" in the earth's crust. This includes the upper and lower Jordan, the Dead Sea, and the Sea of Galilee, Tiberias, and Jericho.

Although the average annual rainfall over a large part of Palestine is as great as that of London, the country suffers from want of water in summer. The whole of the rainfall occurs between November and April. During the summer months a majority of the inhabitants and their domestic animals depend upon supplies of rain-water collected in catchment tanks.

The winter months, although very wet, are usually mild along the coast, the thermometer seldom falling to freezing-point. In some years there may be a considerable snowfall on the higher parts of the mountain ranges. There are frequent and terrific gales, alternating with tremendous storms and downpour.

The spring commences fitfully in January or February, and for three months the country is a land of flowers, of wonderful abundance and variety.

COLEOPTERA.

At the commencement of the wet season, when the first autumn crocuses and dwarf cyclamen peep forth, and the parched country begins to look green once more, the mountain slopes form an ideal hunting-ground for beetles. Hundreds may be found in an hour or so by turning over loose stones and rocks.

Adults of *Carabus punctulatus*, Bon., were plentiful in November and December. Early in January several larvæ were found. These were kept in a tin half filled with earth, and supplied with slugs. These molluscs were readily attacked by the larvæ. Usually the first thing that happened was the decapitation of the slug by a few powerful strokes of the strong jaws. The body was then slit open along the side, and the juicy contents eaten. Apparently the skin is too nasty, even for these permanently hungry larvæ, as it was generally avoided, and left to shrivel up. On more than one occasion several slugs were eaten in quick succession by the same larva, and one day a large larva completely devoured an earthworm about

four times its own length, resulting in enormous distension. The soft integument between each segment was tightly stretched, and for two days the larva remained in a comatose condition, lying helplessly on its side, and refusing to be tempted by any fresh victims. I found that the larvae would never touch millepedes (*Julus*), which were found plentifully under stones, in similar situations to those from which the larvae were taken. One of the larvae pupated on March 10th, and the adult emerged at the end of April. Many of the mature insects were found on Mount Carmel, during the wet season, at 300 ft. and above, and specimens were also found at Nazareth up to 2000 ft. It is probably widely distributed over the central mountain chain.

Calathus juscipes, Goeze, and two other species of the genus, at present unnamed, were also found on Mount Carmel, and on the hills at Nazareth, in November, December and January. Quickness of the hand and eye are required to capture these, as they immediately run for safety down the nearest crevice on the stone being turned.

Other captures belonging to the Carabidae include unnamed species of *Brosius*, *Pristonychus* and *Cymindis*, all from Mount Carmel, in November and December; and *Stenolophus vaporariorum*, F., at the end of September on Mount Carmel.

Representatives of the Tenebrionidae were plentiful, notably *Tendarus impressus*, Reiche, of which scores could be collected in a few minutes. Mount Carmel during the wet season: *Daiolygontha crenata*, Reiche, from the same locality, and another unnamed species of the genus, Haifa, 1 : vii : '19. *Tentyria laticollis*, Krtz., Haifa, on sandy soil, at sea-level, 29 : xi : '19. *Adesmia ulcerosa*, Klug., Haifa, 25 : xi : '19. *Pimelia mitrei*, Sol., and *P. nazarena*, Mill., under stones amongst palm trees, sandy soil, Haifa, 29 : xi : '19. *Tentyria herculeana*, Reiche, Haifa, 1 : viii : '19, and Mount Carmel, November. *Gonocephalem rusticum*, Oliv., Haifa, November. *Opatrium libani*, Baudi, and *Opatrioides longulus*, Reiche, Mount Carmel, November and December. *O. punctulatus*, Brull., Haifa, 29 : xi : '19. *Cossyphus rugosulus*, Peyron, Haifa, along the Nazareth road, under rocks, 29 : xi : '19. *Scaurus puncticollis*, Sol., Ludd, 25 : x : '19. *Amnodeis giganteus*, Reiche. The remains of one of these were found under a stone in the Anti-Lebanon mountains, between Damascus and Baalbek, in September, 1919.

Of the Tiger beetles, *Cicindella lunulata*, F., was common on muddy banks at the mouth of the Kishon river, near Haifa, in July, 1919, and of the water-beetles, *Cybister lateralimarginalis*, deG., was taken from pools at Athlit, near the coast, 2 : vii : '19.

The weevil *Hypera variabilis*, F., a pest of clover and lucerne, was found at Haifa, 29 : vi : '19.

The lady-birds, so far, are represented by *Chilocorus bipustu-*

latus, L., Jerusalem, 6 : ix : '19, and an unnamed species of *Lithophilus*, Haifa, 29 : vi : '19.

The following complete my captures of Coleoptera to the early part of this year: *Hister græcus*, Brul., common on Mount Carmel in November and December. *Trox hispidus*, Pont., a few at Haifa in November. *T. perlatus*, Goeze, Haifa, 3 : xi : '19. *Aphodius granarius*, L., Mount Carmel, November, and *Chrysomela chalcites*, Germ., from the same locality. *Dermestes vulpinus*, F., and *Necrobia rufipes*, deG., Haifa, July, 1919. *Melyris versicolor*, Chev., common on flowers at Haifa, July, 1919. *Lasioderma serricorne*, F., and *Melanotus fuscipes*, Gyl., Haifa, June, 1919. *Coryna birecurva*, Mars, var., Acre, July, 1919. Unnamed species of *Arrhaphipterus*, *Agrypnus* and *Ablattaria*.

(To be continued.)

SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

By F. C. WOODFORDE, B.A., F.E.S.

(Continued from p. 157.)

Aglais urticæ.—Upwards of 120 with several remarkable aberrations. The most striking is one from the Spilsbury Collection with no data. The whole of the ground-colour is creamy-white. A very perfect ab. *ichnusoides* almost exactly corresponding to the figure in Seitz was taken wild in N. Staffs, July 30th, 1918. In another ab. *ichnusoides* taken at Parsons-town, in Ireland, by the Hon. G. L. Parsons, in August, 1886, the black spot of the inner margin is greatly enlarged and prolonged towards the inner angle of the fore wings and the outer portion of the wing is much suffused with a dark shade, thus greatly reducing the red ground-colour. Another remarkable specimen of the same type has the outer margin of the fore wings of what can only be described as a pale mud-colour. It is from the Hope Collection, and is labelled "S. Wales, St. David's, 1876." In two specimens taken wild on two successive days in a garden in the town of Market Drayton, by Mr. H. G. F. Onions, the ground-colour is of a pale ochreous brown, as are also the usually yellow spaces between the black costal spots. A series of five very similar specimens, but with the yellow spaces of the normal colour, was bred by Mr. P. Tautz from larvæ found at Chorley Wood, Rickmansworth, in 1914. Possibly the pupæ of these, as well as the pupæ of the specimens of *V. io* referred to further on, were subjected to abnormal conditions, but the labels attached make no mention of such

being the case. Two specimens from Herts, one from Bute and one from Kincardine, make approaches towards the subspecies *A. polaris*, Stgr. From Morthoe, N. Devon, a fine specimen, taken by Dr. F. A. Dixey, F.R.S., August 25th, 1892, very closely approaches the Japanese form ab. *connexa*, Btlr., but there are faint indications of blue spots at the margin of the fore wing.

Vanessa io.—Series of 80, from many English localities and two from Tyrone, with few aberrations. One very remarkable one was taken in the Museum grounds in 1878. The fore wings are normal except that the yellow portion of the interior edge of the ocellus is much reduced in size and the space between the black costal spots is dull ochreous. In the hind wings the normal blue and black centre of the ocellus is reduced to a small black spot set in the middle of a circular patch of very pale ochreous colour. In a series of 10 bred from larvae found in Chorley Wood, Rickmansworth, Herts, in 1914, by Mr. P. Tautz, the typical red is replaced by a dull maroon or madder-purple colour. The two specimens from Tyrone have a black spot below, but touching, vein 2 in the inner discal portion of the fore wings.

Euanessa antiopa.—Fifteen specimen. Three from the Hope Collection, and one from Spilsbury Collection, all unlabelled. Another from the Spilsbury Collection is labelled "Bred by the late Mr. Kirby [author of an 'Introduction to Natural History'], given to me by Mr. Dummitt, of Uttoxeter." Another also from the Spilsbury Collection is labelled "Caught by — Farrell, near Macclesfield, September, 1858." A specimen in splendid condition was taken by the Rev. J. W. B. Bell on a sugared post at Pyrton, Oxon. This specimen was recorded in the 'Entomologist,' 1900, p. 250. Two specimens taken at Cromer in late August or early September, 1872, by Miss M. C. and Miss E. H. Lowe, were presented to the collection by Prof. Poulton. A hibernated specimen taken by a boy at Maple-durham in the spring of 1873 was presented to the Collection by Prof. Poulton. A very fine and perfect specimen from the Chitty Collection is labelled "New Forest, 11/6/92." Another from the same collection is labelled "New Forest, 10/8/88. 'Entomologist,' vol. xxi, page 229." A specimen from the Meldola Collection labelled "G. Ruffel, Bigods, Sept. 20, 1900." One from the Sellon Collection, labeled "Worthing, 1879." Another from the same collection labelled "Salwey's Collection originally from F. Standish's."

Pyrameis cardui.—Upwards of 70, with no noteworthy aberration.

P. atlantica.—No aberration, except one small but apparently very rare, consisting in the absence of the lowest of the normal five subapical spots. It was bred in the New Forest by C. Gulliver, October, 1912.

Argynnis paphia.—Upwards of 80 specimens, including 39 ab. *valesina*, with otherwise no noteworthy aberrations.

A. cydippe.—Upwards of 60 specimens. A beautiful aberration in which the ground-colour is creamy-white, taken in S.W. Bucks by Miss L. B. Evetts, July, 1896.

A. aglaia.—A fine series of more than 80, with much slight variation in the females, some being very dark.

Issoria lathonia.—Eleven specimens. Four from the Hope Collection, each labelled "Wells British Collection." Four from the Spilsbury, without any data. One from the Sellon Collection labelled by Mr. Sellon "Salwey's Collection." Another label, apparently Salwey's original label, has on it, "Folkestone, 1868, presented by T. Briggs, Esq." Two other specimens are labelled "O.E.S." (Oxford Entomological Society).

Brenthis euphrosyne.—Series of 90 specimens. A fine aberration from the Hope Collection without data has the interior portion of all the wings blackish, this coloration extending nearly to the transverse row of submarginal spots. The rest of the wings is much suffused with black. An underside taken May 29th, 1916, near Abingdon, Berks, by the Rev. C. F. Thornewill, entirely wants the normal reddish markings, and the ground-colour is of a very pale ochreous. A specimen of that very rare occurrence, a second brood, taken August, 1899, near Reading, by Mr. W. Holland, is in perfect condition and much below the normal size.

B. selene.—Series of over 100. A fine aberration taken June 11th, 1913, at Crowthorne, Berks, by the Rev. C. F. Thornewill, has a broadish black band in the outer portion of the fore wing along the margin. All the wings are also much suffused with black. A series of 11 specimens of a second brood from the Pogson-Smith Collection was taken near Oxford, August 8th, 1911. They are in perfect condition and much smaller and paler than normal first-brood specimens. Another specimen of the second brood from the Chitty Collection was taken at Dodington, Kent, in August, 1895.

Melitaea cinxia.—Series of 60. One specimen from the Spilsbury Collection, without data, has the row of spots in the central pale band on the underside of the hind wing very large and some of them converted into streaks.

M. athalia.—Series of 63. Mostly from Kent and Sussex, with no remarkable aberration.

M. aurinia.—Series of upwards of 130 from many English localities, six Scottish and one Irish specimen. The series is interesting in showing the slight variation between the series taken in different localities, but there are no very striking aberrations. In a specimen from the Meldola Collection taken at Ivybridge, June 23rd, 1889, and in another without data from the Sellon Collection, the paler ochreous markings are

absent and the whole ground-colour of the wings is tawny fulvous. The series of six from Scotland, bred from Oban larvæ, May, 1913, presented by Mr. A. Horne, has the pale markings of a cream colour, giving the series a very striking appearance.

SATYRINE.

Melanargia galatea.—Series of upwards of 90. No very remarkable but several minor aberrations. In two specimens from Kent, both females, and one from Northants, a male, on the upper side the outer black band in the hind wing is almost obsolete, only the ocelli being left, which are thus rendered very conspicuous.

Erebia epiphron.—Thirty-eight English from Lake District, 13 from Perthshire, 20 without data. From the Meldola Collection is a specimen labelled "Lake District," but without date, of a unicolorous dark brown = ab. *obsoleta*, Tutt.

E. aethiops.—Series of 24 English, 50 Scotch, 10 without data. No very striking aberration.

Hipparchia semele.—Series of 100. Much variation of a minor character, but none very remarkable.

Pararge aegeria.—Series of upwards of 70.

P. megaera.—Upwards of 60.

Epinephele jurtina.—Series of upwards of 100, with several striking aberrations. Two females, one from the Meldola Collection, taken in the New Forest, the other from the Pogson-Smith Collection, taken at Nettlebed, Oxon, have the fulvous subapical blotch on the fore wing white instead of the usual fulvous. A very remarkable female taken September 1st, 1891, by Mr. W. Holland, has nearly the whole of the right fore wing bleached, but retains in the bleached portion traces of the fulvous subapical blotch of the normal colour. In the left fore wing only the apex is bleached. In both the ocellus is reduced to a white spot surrounded by a very narrow ring of black. On the right hind wing is an oblique bleached stripe from the middle of the costa to the anal angle. From the Meldola Collection is a very beautiful symmetrically bleached female taken near Romford, Essex, in July, 1895. Towards the apex of the fore wing is a large irregularly-shaped white blotch of similar size, shape and position, on each wing. Both hind wings have the central portion of the wing bleached, with a narrow margin of normal colour running completely round the wing. There are seven other specimens with partial bleaching of the wings.

Epinephele tithonus.—Series of 70. Six specimens have supernumerary black spots on the fore wings. One from the Chitty Collection, labelled "New Forest, 1890," has the outer margin of the right fore wing bleached, and the central dark

band is almost obsolete. The left fore wing is normal except that the outer marginal band is very light brown. From the Champion Collection, labelled "Woking," is a remarkably dwarfed male.

Aphantopus hyperanthus.—Series of 95. Two undersides, one from near Bude, the other from the New Forest, are asymmetrical on the undersides, having three ocelli on one fore wing and only two on the other. A fine specimen of ab. *arete*, Müll., was taken by Mr. F. A. Dixey in Darenth Wood, July 17th, 1876. Two other specimens of ab. *arete*, one from the Hope, the other from the Spilsbury Collection, are without data.

Cœnonymphia tiphon.—A series of over 50 Scotch specimens and 54 English = ab. *rothliebii*, with 18 unlabelled, mostly English, from the Hope and Spilsbury Collections. The English specimens show a very great range of variation of the size of the ocelli on the underside.

C. pamphilus.—Series of over 80, with no remarkable aberration.

Nemeobius lucina.—Series of 80.

(To be continued.)

CONTRIBUTIONS TO OUR KNOWLEDGE OF THE BRITISH BRACONIDÆ.

By G. T. LYLE, F.E.S.

No. 6.—AGATHIDÆ.

In the 'Genera Insectorum' Szeplegiti catalogues twenty-eight genera belonging to this sub-family containing 222 species. The very great majority are exotic, for undoubtedly the true home of the group is in the tropics, but few representatives having strayed to northern latitudes. Five genera only are known to be British, and of these *Neoneurus*, Hal., was classed by Ashmead* with the Microgasteridæ, while he placed *Orgilus*, Hal., in a distinct tribe between his *Blacini* and *Calyptini*. In addition he followed Forster in making a separate sub-family of *Microodus* and *Earinus*, as distinct from *Agathis*, merely on account of the difference in the length of the face, but, as Marshall truly remarks, "this in our opinion is not a sufficient reason for the establishment of a sub-family, the rest of the structure in both groups being similar." It is perhaps fortunate that Szeplegiti has re-united the various genera, although such classification is not without difficulty.

Marshall gives the following characters :

* 'Proc. U.S. Nat. Mus.'

Clypeus entire, mouth closed, maxillary palpi 5-6, labial 3-4-jointed. Eyes glabrous, vertex short, occiput concave; face subtriangular, often very elongate. Mesothoracic sutures distinct (excepting in *Earinus*). Cubital areolets 2 or 3; in the latter case the second is minute, subquadrate or triangular, first cubital often confused with the first discoidal, radial cell minute, straight, lanceolate, not nearly reaching the apex of the wing; nervures distinct, recurrent nervure rejected, submedian cell as long as or longer than the median. Terebra elongate.

TABLE OF GENERA.

- (8) 1. Fore wings with three cubital cells.
- (3) 2. Antennæ 16-jointed *Neoneurus*, Hal.
- (2) 3. Antennæ with more than 16 joints.
- (5) 4. Clypeus and face triangularly produced *Agathis*, Lat.
- (4) 5. Clypeus and face not triangularly produced or very slightly so.
- (7) 6. First cubital cell confused with the first discoidal, mesonotum very distinctly trilobed. *Microdus*, Nees.
- (6) 7. First cubital cell separated from the first discoidal by a nervure, mesothoracic sutures effaced or almost so *Earinus*, Wesm.
- (1) 8. Fore wings with only two cubital cells *Orgilus*, Hal.

The three genera *Agathis*, *Earinus* and *Microdus* are distinguished from one another by characters of but little more than specific value. *Agathis* has the face produced to a much greater extent than in *Microdus*, though the difference is not more than may be found between species of the genus *Apanteles*. The principal distinction between *Microdus* and *Earinus* is the extent of the development of the nervure which divides the first cubital cell from the first discoidal—a most unsatisfactory character which varies considerably even in examples of the same species. I am inclined to think that Marshall scarcely attached sufficient importance to a character emphasised by Reinhard, viz. the mesothoracic sculpture, for in every species of *Earinus* known to me there is extremely little or no trace of sutures, while in all those of *Microdus* the sutures are deep and the mesothorax distinctly trilobed. The insects appear to prey exclusively on larvæ of *Lepidoptera*, principally *Tineidae*, and with very few exceptions our British species are anything but common. Considering this scarcity I have been most fortunate in the amount of material I have been able to study. Prof. Paulton has most kindly entrusted to me, for examination at leisure, the whole of the specimens in Dale's Collection, and also several from the old Hope Museum Collection. The Dale Collection was formed by J. C. Dale and his two sons, E. R. Dale and C. W. Dale, during a period of roughly one hundred years, and bequeathed by the last-named to Oxford University some eight or nine years ago. The

earliest specimen in the collection is dated October, 1807, and the great majority of the insects come from Glanvilles Wootton, a small agricultural parish in Dorset, where the Dales resided, although the neighbouring woods of Middlemarsh and Holnest were thoroughly well worked, and, indeed, the surrounding country generally, while occasional visits were paid to Bournemouth (in the days when that now fashionable watering-place consisted of a few fishermen's and coastguards' cottages, backed by heather and pine-clad hills), Purbeck and the New Forest. The earlier specimens, many of which were no doubt seen by Curtis and Haliday, are correctly named, but such is not the case with those of more recent date.

Dr. Hugh Scott, of the University Museum of Zoology, Cambridge, has also granted me every facility for examining the specimens in the University Collection, which, although few in number, are most interesting. Mr. B. S. Harwood with his usual kindness has assisted me in every way possible, and I am also greatly indebted to Mr. Percy Thompson, of the Essex Museum, Stratford, who when visiting Cambridge, brought with him the very interesting *Agathidæ* from the Fitch Collection and so afforded me the opportunity of examining them thoroughly.

GENUS 1. *Neoneurus*, Hal.

In the 'Entomological Magazine,' vol. v, p. 213, Haliday mentions a Braconid having "*Areola radiali appendiculata prædiscoidali autem effusa*." Nothing further was heard of it until Marshall ('Spec. Hym. Eur.,' vol. v *bis*, p. 197) described the sexes and placed the genus doubtfully in this sub-family. Marshall's hesitation appears to have been justified, for with the exception that the radial cell is small there seems to be little to connect the insect with the *Agathidæ*.

The single species, *N. Halidayi*, is quite unknown to me. Marshall captured a pair at flowers of *Umbeliferæ*.

GENUS 2. *Agathis*, Latreille.*

Maxillary palpi 5, labial 4-jointed; head seen from the front shaped like an elongate triangle, mesothorax distinctly trilobed; three cubital cells, the first never distinctly separated from the first discoidal; † wings infuscated, with a pale streak under the stigma. Segments 1–3 of the abdomen longer than the rest taken together, 2 and 3 each marked with a curved transverse impression.

The shape of the second cubital cell is irregular and inconstant so that it is not a character to be greatly relied upon for separating the species. Small obscure insects but rarely met with, and, in spite of the fact that they prey upon larvæ of Lepidoptera, very infrequently reared.

* 'Hist. Nat. Crust. Ins.,' vol. iii, p. 175.

† See, however, under "Microodus."

TABLE OF SPECIES.

- (4) 1. Abdomen above centrally more or less rufous.
 (3) 2. Wings pale at base, somewhat dark at apex. *malvacearum*, Nees.
 (2) 3. Wings much darker, with a whitish streak beneath the stigma *nigra*, var.
 (1) 4. Abdomen entirely black.
 (8) 5. Hind tibiae with at most a faint trace of a dusky ring before base, terebra longer than body.
 (7) 6. Palpi rufous, only basally blackish. *rufipalpis*, Nees.
 (6) 7. Palpi entirely blackish *nigra*, Nees.
 (5) 8. Hind tibiae with a distinct dark ring before base, terebra shorter than body.
 (10) 9. Second cubital cell irregular, usually sub-triangular, terebra as long as abdomen and metathorax or thereabouts *anglica*, Marsh.
 (9) 10. Second cubital cell quadrangular, terebra almost as long as abdomen. *eremisetus*, Nees.

Agathis malvacearum, Nees.*

A single male in the Dale Collection is so named; it has the second abdominal segment rufous excepting at apex, but the first is piceous, antennae 22-jointed; length 4½ mm. To me the specimen appears to approach very nearly to Marshall's rufous var. of *A. nigra* described by him in André, 'Spec. Hym. Eur.', vol. iv, p. 565. In this work Marshall tells us that *A. malvacearum* is found only in Central and Southern Europe, though in 'Trans. Entom. Soc.,' 1885, p. 264, he states that Stephens professed to have taken it in the London district. Westwood informed Marshall that a male and two females were in Walker's Collection at Oxford; these three specimens I have been allowed to examine through the kindness of Prof. Paulton, and find they may all be undoubtedly referred to the genus *Meteorus*.

Morley records it as taken by Dominsthorpe in abundance at Rye, in August.

Agathis nigra, Nees.†

A rather stont, dusky-winged species with the terebra as long as body and head combined; antennae 22-24-jointed. Nees describes the femora as "*basi parim nigra*," but in all the examples I have seen the hind and middle femora are concolorous, as in Marshall's specimens.

Harwood has a male labelled "Higham, 27/7/85," and in Dale's Collection are two females and seven males; two of these have the second abdominal segment at the base decidedly dull

* 'Mon.,' vol. i, p. 137.

† *Idem*, vol. i, p. 128.

rufous. All are without data excepting one which is labelled "Newton, 1903" (possibly this is Buckland Newton, in Dorset). Ten of the eleven specimens mentioned by Marshall as having been bred by Elisha from *Eupaecilia roseana* are still in the Fitch Collection.

Agathis anglica, Marsh.*

Up to the present recorded only from Britain, and said by Marshall to be commoner than *A. nigra*, from which species it may be distinguished by the noticeable dark ring before the base of the hind tibiæ and shorter terebra (as long as abdomen and metathorax or rather longer). The author also mentions that the antennæ have more joints, viz. 29–31; in Dale's Collection, however, is a female which I feel confident may be referred to this species, having only 24-jointed antennæ. In my own collection is a female that has 28 joints and also a male with 26.

A female in Dale's Collection is labelled "B.N." and Harwood has another from "Box Hill, 27/6/85." I took a male on the muddy shore of the Solent, near Lymington, August 2nd, 1916, and a female from bushes on the Gog Magog Hills, Cambridge, June 8th, 1917.

Marshall tells us that W. H. B. Fletcher reared the species from a *Coleophora* and also from *Depressaria nervosa*, Haw. A pair in the Fitch Collection bear Marshall's label, "*A. anglica*, n. sp."

Agathis brevisetis, Nees.†

The males are difficult to distinguish from those of *A. nigra* and *A. anglica* though perhaps rather larger; the females, however, are easily separated by the length of the terebra, which in this species is much shorter. In *brevisetis* the second cubital cell is usually subquadrate while in *nigra* and *anglica* it is usually triangular, but, as before mentioned, the shape is inconstant.

Harwood has three females on one card (bearing Marshall's yellow label), which, judging from the mounting, came from Cameron's Collection, and which are probably the three specimens taken by him in Scotland and mentioned by Marshall. These insects have the terebra stout, pilose, and distinctly rather shorter than the abdomen, so agreeing with Nees' description.

Bignell records it from *Coleophora troglodytella* and *Nannodia hermanella*.

Agathis rufipalpis, Nees.‡

In the Essex Museum is a single female under this name; two labels are attached, one I believe in Marshall's writing,

* 'Trans. Entom. Soc.', 1885, p. 265.

† 'Mon.', vol. i, p. 131.

‡ 'Mon. Af.', vol. i, p. 129.

"rufipalpis certissime," and the other "Ex. Gl. *Hermanella*, G. Elisha, 6784"—no doubt the example seen by Marshall and noted by him in 'Trans. Entom. Soc.,' 1885, p. 266. I find that the terebra is not longer than the abdomen (it is certainly not broken), and therefore scarcely agree with Marshall in considering the insect to be *rufipalpis*, Nees, which has the terebra longer than the body. Being "set" in an awkward position I have been unable to satisfactorily examine the specimen; the palpi, however, are certainly rufous.

The only other British record is that of Curtis ('Guide,' 2nd ed., col. 116).

GENUS 3. *Microdus*, Nees.*

Very similar to the last, though the face is not produced to anything like the same extent and the mesothorax is perhaps more distinctly trilobed. As at present understood, the genus is co-extensive with *Eumicrodus*, Forster,† and the subgenus *Therophilus*,‡ of Wesmael.

Ten species are now known as British. I have omitted *M. brevicaudis*, Rein.§ as I find that the single male recorded by Marshall should undoubtedly be referred to the genus *Agathis*; the specimen is still in Fitche's Collection. As described by Marshall, it has a distinct nervure separating the first cubital cell from the first discoidal (further proof of the doubtful value of this character as a means of classification), and is also anomalous in having the first abscissa of the radius obsolete. The antennæ are 27-jointed, as stated on a label attached, and not 29 as noted by Marshall. Underneath the card on which the specimen is mounted is written "Bred, 24/7/75, fr. l. case of *Coleophora troglodytella*, Guestling, Hastings"; there is also a small green label bearing the number 11. This insect is very near *Agathis anglica*, though, of course, differing in the characters mentioned above; it is certainly not a *Microdus*, the face being characteristically produced.

TABLE OF SPECIES.

- | | | |
|-----|--|---------------------------|
| (2) | 1. Mesothorax rufous. | <i>calculator</i> , Fab. |
| (1) | 2. Mesothorax black. | |
| (8) | 3. Second abdominal segment more or less rufous or testaceous. | |
| (5) | 4. Second segment entirely testaceous. | <i>conspicuus</i> , Wesm. |
| (4) | 5. Second segment not entirely testaceous. | |
| (7) | 6. Second segment rufo-testaceous with a central black patch | <i>linguarius</i> , Nees. |

* Mag. Ges. Nat. Fr. Berl., vol. v, p. 184.

† Verh. Nat. Ver. Preus. R. vol. xix, p. 247.

‡ Nony. Mem. Ac. Brux., 1837, p. 15.

§ Berl. Ent. Zeit., 1867, p. 356.

• Trans. Entom. Soc., 1885, p. 274.

- (6) 7. Second segment black with a rufous spot at either side *clausthalianus*, var.
- (3) 8. Second segment entirely black.
- (13) 9. Hind tibiæ rufous or ochreous with apex fuscous.
- (16) 10. Third abdominal segment smooth.
- (12) 11. Orbitæ with a rufous spot, length $4\frac{1}{2}$ mm. *tumidulus*, Nees.
- (11) 12. Orbitæ immaculate, length 6 mm. . . . *clausthalianus*, Ratz.
- (9) 13. Hind tibiæ not rufous or ochreous, with apex fuscous.
- (15) 14. Hind tibiæ blackish throughout *nugax*, Rein.
- (14) 15. Hind tibiæ half black, half white *cingulipes*, Nees.
- (10) 16. Third abdominal segment at least partially acciulate or coriaceous.
- (18) 17. Hind coxæ rufous *rufipes*, Nees.
- (17) 18. Hind coxæ black.
- (20) 19. Hind tibiæ rufous with apex black *mediator*, Nees.
- (19) 20. Hind tibiæ half white, half black *rugulosus*, Nees.

Microdus calulator, Fab.*

A fine, handsome species, distinguished principally by the rufous mesothorax and black hind femora and tibiæ (hind femora rufous at apex and hind tibiæ narrowly whitish at base). A very scarce insect and in this country known so far only from the New Forest, where in 1822 Curtis captured both sexes alighting on the stool of a felled tree. In the Dale Collection is a gigantic female having a length of $7\frac{1}{2}$ mm., which was taken in the New Forest on July 1st, 1881 (the date is indistinct and may possibly be 1831), while in the Cambridge University Museum is a pair obtained by Dr. Sharp in the same locality in June, 1902; the Cambridge specimens have a length of only 6 mm.

Marshall throws doubt on the correctness of Curtis's figure ("B.E.", plate lxxiii), where the antennæ are depicted as longer than the body, as according to Nees they should be shorter. All the antennæ of the specimens taken by Dr. Sharp are broken but fortunately Dale's example has one intact; this is certainly rather shorter than the body.

Microdus conspicuus, Wesm.†

In 1885‡ Marshall described a new species of *Earinus* under the name of *E. zonatus*, from two specimens, presumably both males, in Fitche's Collection. The types (on gilt pins) are still in existence though one is in a deplorable condition, the whole of the abdomen and half the thorax having been eaten by mites,

* 'Ent. Syst.', sup., p. 225.

† 'Nouv. Mem. Ac. Sc. Belg.', vol. x, p. 17.

‡ 'Trans. Entom. Soc.', p. 268.

the remains being attached to the pin, apparently, merely by a plentiful growth of verdigris. Of this insect there is left only the head, scape of both antennae and half flagellum of one, dexter half of thorax with two wings and three legs attached and sinister fore leg : the other type is in better state, wanting only the tips of the antennæ.* Marshall describes the first cubital cell as being very distinctly separated from the first discoidal, and when examining the specimens I was surprised to find that although this is correct of one example, in the other the dividing nervure is widely interrupted. As I have elsewhere remarked, in my opinion far too much importance has, in the past, been attached to the development of this nervure as a means of classification, and no doubt the well-marked division in one of his types misled Marshall into thinking that the insect should be referred to the genus *Earinus*. The distinctly trilobed mesothorax and rugose metathorax leave no doubt in my mind that the species is a *Microdus*, and I should certainly ascribe it to *M. conspicuus*, Wesm., the only points of difference I can detect (excepting that the insects described by Marshall are perhaps rather lighter than Wesmael leads us to believe) being in the colour of the hind tibiae and in the number of joints of the antennæ (31 according to Wesmael and 32 given by Marshall). Wesmael describes the hind tibiae as black at the tips, but this is not so in Fitche's specimens, all being concolorous. Such a small difference in the tibial coloration is not, however, of primary importance.

In the male the posterior orbits only are reddish and the abdomen black with the second segment testaceous, basal half of the antennæ also testaceous, and second abdominal segment with a curved, transverse, impressed line. Length about 4 mm. The female is said to have the abdomen entirely testaceous or rufo-testaceous after the first segment and the orbits more marked with testaceous than in the males; tibiae as long as the body.

One of Fitche's insects bears Marshall's yellow label " *Earinus zonatus*, n. sp." and both are ticketed as from *Euparcilia notulana*.

* The condition of Fitche's Collection is greatly to be deplored. I understand that during the last twenty years or so of his life, his time being very fully occupied with local government affairs, he took little or no interest in entomology and his collection suffered in consequence,—particularly from the attacks of mites. After his death the greater part of the collection, contained in a cabinet, was purchased, fortunately before it was irretrievably ruined, by the Trustees of the Essex County Museum, and it is good to know that these specimens are now in such good hands. Not until some years later was Mr. B. S. Harwood, by a lucky chance, enabled to save from destruction the remainder of the collection, which was housed in several store-boxes. Mites and mould have, however, worked terrible havoc with the contents of these boxes, great numbers of the specimens having utterly perished. The Fitche Collection is made particularly valuable by containing numbers of Marshall's types.

Microdus linguarius, Nees.*

A fine robust species ; seemingly rare, though Morley tells us that Butler has taken it commonly at Abinger Hammer. Distinguished by the very long terebra (three times as long as the abdomen) and the rufo-testaceous second abdominal segment, which has an isolated central black patch. The first abdominal segment is striolate and but little longer than its apical width ; mesothorax broad, with the sutures very distinct.

In the Fitche Collection is a female labelled—" Given to me, British ? "

Microdus tumidulus, Nees.†

Probably the commonest species we have. A small robust insect having the legs rufous, with the exception of the coxae, upper trochanters, hind tarsi and hind tibiæ at the apex ; metathorax rugulose with traces of two medial, longitudinal carinæ and a smooth space on either side at the apex ; second cubital cell triangular, radial cell very small, radius straight or almost so ; antennæ usually 28-jointed ; terebra slightly shorter than abdomen and thorax combined. Marshall gives the length as 3-4½ mm., but I have seen none less than 4 mm., the size mentioned by Nees. Marshall's "var. 1," which has the hind coxae rufous, seems to be rare, the only example I know being in the Cambridge University Museum ; it was taken by F. Jenkinson at Cambridge in 1907. There are two females in the Dale Collection, one marked "G.W." and the other "B.O." On the Gog Magog Hills, near Cambridge, and also at the Fleam Dyke it is common, and I have many times taken it when sweeping, my earliest date being August 5th and latest September 7th.

Microdus claustralianus, Ratry.‡

Very near *tumidulus* ; indeed, Marshall says—" Probably the size of this species and colour of the squamulae are the only real means of determination." The squamulae are said to be black instead of rufous or piceous as in *tumidulus*, but this character is inconstant and of little value. Nevertheless, the two are no doubt distinct. *Clausthalianus* has the terebra quite as long as the body, while in *tumidulus* it is slightly shorter. A female in the British Museum has a very distinct rufous spot on either side of the second abdominal segment, and this marking is present, though not so noticeable, in two of the three specimens in Dale's Collection. A fine female in the University Museum, Cambridge, was taken at Wicken, July 26th, 1891. In Fitche's Collection is a female bred from either *Ephippiphora scutulana*

* 'Mon.' vol. i, p. 149.

† 'Mon.' vol. i, p. 147.

‡ 'Ich. d. Forst.,' vol. i, p. 58.

or *E. cirsiana* by W. Bennett (no doubt the specimen recorded by Marshall), accompanied by its white, shiny, transparent cocoon. This cocoon is 10 mm. in length by $2\frac{1}{2}$ mm., and somewhat attenuated at either end, the insect having evidently emerged through a jagged hole at the side. There are also two males and three females from *Semasia rufillana* and a pair from *Depressaria atomella*, all reared by G. Elisha in July, 1883.

Microdus nugax, Rein. *

Introduced as British by Morley,† who tells us he captured a male at *Spirea ulmaria* at Foxhall and has a female taken by Saunders at Greenings in 1872.

Microdus cingulipes, Nees. ‡

Very similar to *tumidulus* but easily distinguished therefrom by the black and white hind tibiae and the minute radial cell.

The only species known to Bignell, who reared it from a *Coleophora*. Two females recorded by Marshall are still in Fitch's Collection and in good condition; one is dated August 11th, 1870, and the other labelled "Bugb." In these examples the terebra is not as described by Nees and Marshall as long as the body but only a little longer than the abdomen and metathorax. Under this name in the Dale Collection are several specimens which should quite certainly be referred to *tumidulus*.

(To be continued.)

NOTES AND OBSERVATIONS.

HURBECs.—The following notes, which will interest entomologists, are excerpts from 'Notes and Queries' of June 26th, 1920: "Hurbecs. This equivalent to the word 'caterpillars' is probably a Swiss or Roman term, which has dropped out of use. It is to be found in David Martin's translation of the Bible into French, which is that most commonly in use in the Cantons Vaud and Neuchâtel. It is also retained in the editions (revised) issued by the British and Foreign Bible Society, printed in Brussels. . . . The actual rendering of the original Hebrew word, according to Dr. Driver, should be the larva or wingless progeny of the locusts.—L. G. R." Roquenfort's 'Glossaire de la Langue Romane' (Paris, 1708) gives: "Hurebec.—Chenille de Vigne"—that is, caterpillar of the vine.—Herbert-Maxwell." It would be interesting to know what particular vine-feeding larva is indicated.—H. R.-B.

ZYGENIDAE IN THE CHILTERNNS.—On July 4th I visited the Bucks Chilterns. There are certain localities in the hills where the usual flora of the chalk formation is almost wholly wanting. The great stretches of *Hippocratea connosa* and *Helianthemum chamaecistus*, now

* 'Berl. Ent. Zeits.' vol. xi, p. 352.

† 'Entom.'

‡ 'Mon.' vol. i, p. 118.

in all their golden glory elsewhere, had disappeared, but the display of *Lotus corniculatus* was more beautiful here than I have ever seen it. The close-cropped grasses and hawkweeds of the downs are also unrepresented at such spots, their place being taken by the high grasses beloved of *Aphantopus hyperanthus* and *Melanargia galatea*. It was, indeed, to determine how it fares with the latter species that I made the little expedition; and not in vain, for though only just emerging I saw males sufficient to justify the hope that *galatea* is re-establishing itself satisfactorily. On the same ground I had taken two years ago *Z. hippocrepidis*, Stephens, and the females were present in some numbers, though usually worn, flying with *Z. trifolii*, *trifolii* being in perfection and in great force, and observed for the first time by me in the Bucks Chilterns. Males of *Z. filipendulae* were also just beginning to fly, and I observed particularly how active these three Zyganidae—usually so sluggish—are when the sky is overcast or heavy. They seem to revel in this sort of noontide twilight, but keep sedulously apart from one another. I have no doubt other observers must have encountered *trifolii* hereabouts before; as there is no record, however, for the county in Tutt's 'British Lepidoptera,' vol. i, and only one—Great Marlow—for *hippocrepidis*, I think my observations may be useful.—H. ROWLAND-BROWN; Harrow Weald, July 7th.

OBSERVATIONS ON THE LARVAL HABITS OF DIMORPHA (ENDROMIS) VERSICOLORA, L.—For the first time in the Alpes-Maritimes we have taken fourteen larvae of *D. versicolora* this season—on birch of course. They were in each case in the second instar (I found the batch of eggs on a dead twig somewhere about the tree), seven on one tree, three on another, and four on another, in different localities, but all in the same valley. I suppose the extraordinary habits before spinning up have been noted many times, but I have never reared the species before. I kept them in my room on large fresh branches of birch in wine-bottles, and a newspaper under; they have fed up magnificently. What astonished me is the self-effected purgation of the entire alimentary tract. This is produced by the larva, a short time after ceasing to feed, licking itself—one may say so for the process—all over from head to foot, anointing very thinly every part of its body with a liquid which dries rapidly as it is produced; and it does not even forget to "varnish" its legs and feet. In a short time—an hour or so—this unction takes effect, producing violent spasmodic but regular contractions from the head to the anal segment, and with the result that the whole body is emptied of its contents in the digestive organs. I have never known of a larva behaving in this way. I watched all of them, and everyone treated itself thus after the purge. They turn pink like *D. vinula*, and descend to spin up amongst moss or leaves. The convulsive contractions are most violent, and quite appalling to witness! I thought, the first time, the larva was ill, but then I recognised the meaning of the all-over licking process. The drug acts through the skin. Has anyone made an examination of the properties of the peculiar secretion, which must act as does ergot of rye on the uterus under certain circumstances.—C. E. MORRIS; Hotel Rabuons, St. Etienne-de-Tinné, A.M., July 3rd, 1920.

[I have not had an opportunity of looking up the bionomics of *D. versicolora*, but there is no doubt the peculiar secretion of the larva in its last instar has been observed and considered, though without arriving at the conclusion reached by Mr. Morris. For example, Mr. A. Bacot contributes some interesting notes on the larval habits of the species in Tutt's 'British Lepidoptera' (vol. iii, p. 246). "Before pupating," he writes "the larva changes to a livid hue, pinkish or purplish on the dorsal area; it shrinks considerably, and the skin becomes moist as though the larva was in a profound sweat. The excrement is mixed with a dark green fluid just before they leave off feeding. . . . I have always connected this trait with silk-spinning, but am by no means sure that there is really any connection."—H. R.-B.]

THAMNONOMA BRUNNEATA IN STAFFORDSHIRE.—When collecting in Staffordshire my friend Mr. C. N. Hughes and I took on June 18th and 19th four specimens of *T. brunnata*, all males and all somewhat worn. The weather was unpropitious and we had no opportunity of further search for the species. The insects were taken at two places, several miles apart.—PERCY C. REID: Feering Bury, Kelvedon.

CHrysophanus phleas, ab.—On June 7th of this year I had the good fortune to take a specimen of *C. phleas* at Sutton Park in this district, with hind wings uniformly black and devoid of any other colour. The fore wings were quite normal in colour, but perhaps a little small proportionally to the hind wings. The insect was newly emerged, from which resulted a mild disaster in the setting as the edge of one wing stuck to the board. As I cannot trace this aberration, I shall be extremely obliged if you can tell me whether or not it has been recorded.—G. P. SUTTON: 60, Oval Road, Erdington, Birmingham.

NOTES FROM TEIGNMOUTH. On July 7th I took a male specimen of the grey form of *Stauropus fagi* on a telegraph post and a female *Sphinx ligustri* on a gate-post. Rhopalocera are scarce even in sunshine, and sugar has only had common visitants so far. Larvae of *Cucullia verbasci* are full fed.—W. BOWATER, F.E.S.; Moseley, Birmingham.

NOTES ON LEPIDOPTERY FROM BUCKS.—During last May I spent several afternoons on the hills near Princes Risborough, and made the following captures: *Melitaea aurinia*: One only. I had not met with this butterfly before around here. *Nemobius lucina*: Several, including one very pale specimen. *Callophrys rubi*: Extraordinarily abundant this year. *Hesperia malvae* and *Nisoniades tages* were also very abundant. Among the day-flying moths were the following: *Ino geryon*: Very abundant. *Zygaena trifolii*. *Macrothylacia rubi*: Abundant. Four *Argynnis paphia* that I was breeding emerged on May 29th. Is not this very early?—WALTER PIERCE: Queen's Road, High Wycombe.

NOTES FROM THANET.—*Euchloe cardamines*: This insect has been remarkably uncommon in this neighbourhood this spring. Personally, I have only seen one specimen—on May 14th. I am too

busy to be able to do much insect-hunting in the daytime, but I am sure I should have seen them had there been more specimens about. *Macroglossa stellaturum*: I saw a specimen on June 13th flying round flowers on the cliffs. From the place where I saw it, added to the facts that the moth was somewhat worn and that yesterday's thunderstorm came up here with a strong wind off the sea, I rather think that this occurrence supports the theory that some of our earlier *stellaturum* are immigrants. *Lobophora viretata*: I took a specimen at Ramsgate on May 12th. I do not know whether this is worth recording, but I have not previously met with this species either in this neighbourhood or on the immediate coast in south-east Essex. *Abraxas grossulariata*: This always abundant moth is flying here at present in greater numbers than usual at this time of the year. No doubt this is due to the warm spell in March. On the 2nd of that month I found larvæ about half grown, frequently on *Euonymus*. The first specimen emerged in my breeding-cages on May 17th, which appears to me to be a singularly early date. Another point I have noticed is that, though, one way and another, I have already seen some scores of this moth here this season, I have not seen a single specimen which even approached a variety. It has occurred to me that either time of year or food may have something to do with this. All the *Euonymus* bushes here have been covered with larvæ, but I only saw one larva (on plum) which was feeding on any other pabulum, although there are plenty of fruit trees and bushes about.—N. O. R. SERJEANT; Cholmeley Hotel, Broadstairs, June 13th.

PYRAMEIS ATALANTA AND P. CARDUI.—On June 10th I took a very dilapidated *P. atlanta* in the Churnet Valley and since that date have met with three more: a very fresh ♀ which remained some time near my home on the 15th ult., and two more near Dovedale on the 19th ult. I saw a *P. cardui* here at Whiston on the 15th ult. I have never before seen four *atlanta* in a single spring, and usually this species is uncommon even in autumn in my own district. Insects have been generally much scarcer than usual this spring, and the only really good capture I have made so far was a *N. chaonia* on May 8th—the first recorded for N. Staffs since 1875 at least. The moth was a ♀ and in good condition.—THOMAS SMITH; Whiston Eaves, Froghall, N. Staffs.

MIGRATION OF PYRAMEIS ATALANTA, ETC.—Last year, for the first time during forty years' observation, not a single example of *Pyrameis atlanta* occurred in our garden. The unusually abundant flights to our shores recorded in the June number of the 'Entomologist' lead me to hope that history will not repeat itself, for on May 23rd I was pleased to note several females. It was interesting, too, to see that one of them came regularly for two or three nights in succession to roost on the same arbutus, this tree having a western aspect. On the 22nd *P. cardui* was in possession of the railway banks on the Chalfont-Road side of Amersham, Bucks, and a visit on the 23rd to the L. & N.W.R. bridge, where I recovered *Pararge megæra* in Middlesex two years ago, was rewarded by the sight of some freshly-emerged males.—H. ROWLAND-BROWN; Harrow Weald, June 19th, 1920.

RAVAGES OF *TORTRIX VIRIDANA* IN MIDDLESEX.—Never in my recollection have the Middlesex oaks been so cruelly tormented by this pest. An avenue, 300 yards long perhaps, in Oxhey Lane was left practically leafless the first week in June, and the same deplorable nakedness was visible wherever I walked in the neighbourhood. It was curious to note, however, that here and there among the affected there would be one immune. Last year the ravages were not abnormal, and in view of previous observations it would appear as though an open winter is particularly favourable to the development of *Tortrix viridana*.—H. ROWLAND-BROWN; Harrow Weald, June 19th, 1920.

GONEPTERYX RHAMNI IN WESTMORLAND.—For a few years prior to 1914 *G. rhamni* was something of a rarity with us in Westmorland, but since then its numbers have steadily increased, until now (May, 1920) it has become once more a fairly common butterfly. On any favourable day in spring hibernated examples can be met with abundantly—particularly in Arnside or Witherslack—either feeding upon the wild hyacinth, or the males may be seen flying low over the open stony places in search of the females, which love to sun themselves in such situations. Copulation takes place in the spring.—JAMES SMITH; 67, Captain French Lane, Kendal, Westmorland.

DEILEPHILA LIVORNICA, ETC., IN DEVONSHIRE.—I had the pleasure of netting a fine specimen of *D. livornica* in my garden on May 22nd this year; there was also another at the same patch of sweet rocket which I failed to net. This and *S. sacaria*, which I took at Tor Cross (September 14th, 1911), are the best two insects I have had the luck to capture since I came into Devon ten years ago.—R. H. MOORE; Heathfield, Plymstock.

DEILEPHILA LIVORNICA IN KENT.—It may be interesting to report that I was lucky enough to catch a good specimen of *D. livornica* on May 23rd.—R. M. A. SUTTON; Clare House, Sidcup.

DEILEPHILA LIVORNICA REARED FROM OVA.—On May 14th Mr. Alfred Hedges, F.E.S., of Sandbanks, Dorset, took a female of this species at rhododendron blossom at Canford Cliffs, and wired me re obtaining ova. I replied, and he was successful in obtaining a good batch. He entrusted most of these to me to try and rear, and I am pleased to report that I have succeeded in obtaining some pupæ which I hope in due course will produce imagines. I give a few particulars that may be of interest. The ova were laid from May 17th to 22nd, the first larva hatched on May 31st, and last on June 5th. Food-plants tried were vine, fuchsia, bedstraw, knotgrass and dock. My larvæ, when young, utterly refused the first two named plants, but took readily to *Galium verum*, on which they were reared till the last skin, when my supply of the growing plants of this species failed. I then fed them on *Galium mollugo* and I noticed that the flowers only were eaten of both species of galium. When all the flowers were eaten larvæ became very restless. The larvæ repose in the daytime right up on top of the partly eaten stalks in the full glare of the sun, if touched they "spit" and emit a dark, almost black fluid, which stains the hand and is very hard to remove. Mr. Hedges tried dock

and found they took to this well. I tried a few on knotgrass and they ate this, but I did not like to risk change of food, so kept them on *Galium* throughout. The first larva to pupate was on July 7th, and on this day I had larvæ of various sizes down to quite small ones. They spin a cocoon among moss similar to *C. elpenor* and *Porcellus*. I will send another report later giving the date of last pupation and first and last emergence.—L. W. NEWMAN; Bexley.

CLOSSUS LIGNIPERDA.—I took a male *Cossus ligniperda* from the footboard of a Folkestone train at Cannon Street Station on June 17th. It had evidently been blown off by the passing train, the thorax being damaged.—FREDERICK GILLET, (Major); Cheriton House, Sevenoaks, Kent.

RESEMBLANCE TO SURROUNDINGS IN MOTHS.—On April 3rd last I came across a specimen of *Phlogophora meticulosa*, Linn., near Boldermere, in Surrey, resting on a wall covered with short ivy. This moth bears so strong a resemblance to a dead leaf, which is very frequently seen in such situations, that one might almost have supposed the position taken up purposely, if this supposition were not so unreasonable. An even more striking case of "resemblance" was noticed on May 7th on Esher Common. A specimen of *Drepana falcataria*, Linn., was hanging to a dried grass stem (probably *Molinia cærulea*, Mœnch.). As it rested its wings appeared to be bent somewhat forward so as to slightly clasp the stem. I first of all took it for a dead leaf, but not feeling quite satisfied went up to examine it more closely, when the "leaf" took to itself wings, flew a short distance, and then was boxed. On May 29th a specimen of *Phalera bucephala*, Linn., was by a great chance seen on the ground in the New Forest in a spot where bits of stick were a common feature. It required both in myself and L. Balcomb, who was with me, considerable faith in what we knew of the moth to enable us to believe, until we boxed it, that the morsel of "stick" was not really such, but a moth in disguise.—W. J. LUCAS.

NEUROPTERA FROM MACEDONIA: A CORRECTION.—Last October you published a note of mine concerning the Neuroptera in Macedonia. Recently I have been in communication with Mr. K. J. Morton, of Edinburgh, to whom, by request, I forwarded specimens of the Neuroptera and *Ascalaphus* I had taken. Mr. Morton now kindly informs me that the Neuroptera is *N. sinuata* and not *N. coa*, and the *Ascalaphus*, *A. macaronius* var. *polyvanensis*, not *A. longicornis*. I must express regret if anyone has been led astray by this unfortunate error, which I can only explain by saying that I am not an expert on the Order, and identified my specimens by a plain plate and text in a general work, which seemed to imply that these species were the only ones of their respective genera found in Europe.—HERBERT MACE; Faircotes, Harlow.

AGRION MERCURIALE, CHARP., ETC., AT EASTLEIGH.—Mr. W. J. Lucas remarks in his 'British Dragonflies' that *A. mercuriale* is no longer known in the Winchester district. I should like to mention that it is in abundance this year along the River Itchen between

Eastleigh and Winchester. The first specimen I took was on June 2nd, and it had the horns of the black mercury-spot of the second abdominal segment lacking: since that date I have taken quite a number, especially males, with abnormal markings, a common form being one with the horns of the above-mentioned spot detached. When flying, *A. mercuriale* so closely resembles the other British members of the genus that it is undoubtedly often overlooked. Another species of the genus *Agrion* not recorded from Hampshire in the above book is *A. pulchellum*, Lind.; this also I have found in the same spot as *A. mercuriale*, but not in such numbers. *A. puella*, Linn., is very common along the Itchen and elsewhere. Other Odonata that I have taken in this district this year at present are *Pyrrhosoma nymphula*, Sulz., *Lihellula depressa*, Linn., *L. quadrimaculata*, Linn., *Eschna cyanea*, Mull. (June 12th), *Calopteryx splendens*, Har., *Cordulegaster annulatus*, Latr. (May 25th), and *Ischnura elegans*, Lind.—F. J. KILLINGTON: 68, Archer's Road, Eastleigh.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—May 27th.—The President in the Chair.—Mr. A. W. Richardson, of Southall, was elected a member.—Exhibition of Living Objects.—Mr. H. Main exhibited the Californian Hesperid *Epargyreus inyarus*, bred from a pupa sent by Miss Fountaine, also *Adscita statices*, larvae of *Meloë* sp. and of *Galerucella lineola* all from Eastbourne.—Mr. Blair, males and the very rare ♀ of *Siphlurus armatus* (Ephem.) from Middlesex; *Odynerus pictus* (Hym.), and *Cassida equestris* with egg-clusters.—Mr. H. Moore, *Callophrys rubi* from Westerham, and *Clytus arietis* from Bromley.—Mr. R. Adkin, a series of galls from willow.—Mr. Dunster, larvae of *Melitaea aurinia* from Somerset.—Mr. Withycombe, *Donacia* sp. from Epping Forest; *Osmylus* sp. from Sevenoaks; and *Melolontha vulgaris* from Richmond Park.—Mr. L. W. Newman, ab. *radiata-lutea* of *Alaratas grossulariata*, an almost black ab. *varleyata*, larvae of *Calymnia pyralina* on elm, four forms of larvae of *Saturnia carpini*, a *Dryas paphia* bred indoors, a *Callimorpha dominula*, varied larvae of *Trichinura cratagi*, etc.—Mr. Sich, imagines of *Nepticula septembrella*, from Hindhead; and larvae of *Salebria betulae* from Richmond.

June 10th.—The President in the Chair.—An exhibition of *Calymnia trapezina*, Messrs. R. Adkin, B. Adkin, Stanley Edwards, A. E. Tonge, Hy. J. Turner, etc., taking part.—Mr. Turner read notes on the variation of the species and gave a summary of the characteristics of various named forms.—Mr. R. Adkin showed a very fine example of the rare ab. *nigra*.—Mr. B. Adkin, a very dark-banded ab. *myrovirgata*, Tutt., and a clear slate-coloured example.—Mr. Withycombe, an immature *Ledra aurita* (Hem.), from oak.—Mr. Bennett, living larvae of *Ennomos illunaria*.—Mr. Main, larval tracks of *Phyllotoma aceris* (Sawf.) in sycamore leaves.—Hy. J. TURNER, Hon. Editor of *Proceedings*.

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EREbia EPIPHRON, KNOCH: ITS SYNONYMY AND FORMS.

By H. ROWLAND-BROWN, M.A., F.E.S.

(Continued from p. 152.)

Meanwhile, an event of importance in the history of our *Erebia* had taken place in Britain. In the original volume of the 'Transactions of the Entomological Society of London' (1812, vi, p. 332) occurs the first description of the butterfly known to succeeding generations as *Erebia epiphron*, var. *cassiope*. The President, who is the industrious and reliable Adrian Hardy Haworth, communicates "A Brief Account of some Rare Insects announced at various times to the Society as New to Britain." The date of publication is June 2nd, 1812, and No. 3 in the list is:

"*Mnemon*. *Papilio* (the Small Ringlet) alis supra nigro-fuscis, fascia postica communi annulari, annulis coccineis.

"Habitat in Scotia.*

"Obs. Statura et magnitudo Pap. Pamphili. *Alæ anticæ supra* annulis quatuor, horum tertius dimidiatus et aliquantillum exterior. *Posticæ alæ* annulis tantum duobus, viz. secundus et quartus anticarum alarum. *Subtus* alæ cupreofuscæ, *anticæ* puntis subtribus fere evanescentibus fuscis fulvo obscure circumcinctis, loco annulorum : *posticæ* fere omnino impunctatae.

"In museo Dom. Francillon, a capore Dom. Stoddart.

"Obs. I have not found any account of this species in the works of Fabricius, Huebner, Herbst, or any other author in my possession."

Haworth's find, indeed, was a variant form of *Epiphron* apparently undistinguished at that time by the writers quoted, and it remains var. *Mnemon* to this day. In a later part of this paper I propose to trace the history of *Epiphron* and *Cassiope* in the United Kingdom. At present, therefore, I content myself with noting the discovery and original publication of the species in Britain. As stated, its bibliography so far on the Continent, with one doubtful exception, is all with the Germans; and it is well to note that none of them, de Villers included, hint at the existence of the type form away from the scene of Knoch's

* We now know that the original published locality of *Mnemon* was incorrect. Stoddard's examples, from which Haworth made his description, were derived from English sources (cp. Dale's 'British Butterflies,' 1890).

investigations of the Harz. Haworth's *Mnemon*, I believe, was never figured.

In 1816, however, there is a double change in the nomenclature (of *Cassiope*). For the first time we have the "grass Erebias" generically separated; and *Papilio cassiope* becomes *Melampias rhodia* in Huebner's "Verzeichniss bekannter Schmetterlinge," published at Augsburg. But what has become of *Epiphron* in this work? It is not sunk in any one of the named species in the group; and I can only conclude that No. 614, which has disappeared or dropped out altogether, must have been this species. The genus *Melampias* has for its type No. 609, *Melampias hyberbia*, *Hyberbius*, "Linn. Syst. Pap. 130, Cram. 168, C.D., and includes the following species only:

- 610. *M. Mnestra*, *Melampus*, Esp. Hübn.
- 611. *M. Rhodia*, *Cassiope*, Fabr. Mant. Hübn. (why is *Cassiope* changed?).
- 612. *M. Janthe*, *Melampus*, Fuesl. Hübn.
- 613. *M. Pharte*, Hübn.
- 614. ?
- 615. *M. Arete*, Fab. Mant. Hübn.

(I have omitted the references to avoid unnecessary repetition.)

Fuessley's rather primitive figure (Verz. 604, f. 6), reveals an unmistakable *Melampus*. But whether my surmise regarding the missing number 614 be correct or not, Huebner at a later date, viz. in the 'Eur. Schmett.', published in 1824, seems to have changed his mind as to the specific identity of *Epiphron* and *Cassiope*. His figures of the latter (626-627 male 628-629 female), are unmistakable. In his description (p. 33) he makes no mention of the white pupil character of the female, though it is perhaps worthy of notice that he limits the regional distribution to the Deutschlands Alpen, while making his "Unevenly Spotted Butterfly" (Ungleichpunktter Falter) synonymous with Fabricius's *Papilio cassiope*. So far as the name *Epiphron* is concerned, it is sunk as a synonym in his *Papilio Janthe*, or "Small Spotted Butterfly" (figs. 624-625 male, 202 female). But whereas the males figured are unmistakable *Melampus*, Fuessley, the female would seem to belong to some other species—the broad band of the fore wings, rust brown with black spots; the small rusty rings of the hind wings also adorned with black spots. His *Janthe* must be considered to be what we know as

* *Hyperbius* is not an *Erebia* at all, though the description might well serve. It runs: "Alis integerrimis fusca area rufa: primoribus ocello bipupillato; posticis subtus septempunctatis, M. L. U., 257. Habitat, Cap. b. spei. D. Tulbagh," and the butterfly figured in 1777 by Cramer (vol. ii, plate clviii, figs. e, f), is the South African species, still confined to Cape Colony, described in Roland Trimen's 'South African Butterflies' (vol. i, pp. 75-76), under the title *Pseudouympha* (Wallengren), *hyperbius*, L. But until Wallengren created the genus, it remained apparently the type of Huebner's *Melampias*, to which by strict priority it should still be referred, and some other generic name found for the European members of the group, if, indeed, they are to be separated from the all-inclusive *Erebia*.

Melampus, and he omits *Epiphron* altogether—a conclusion irresistible when we turn up his reference to Esper's Tab. ciii, Cont. lviii, fig. 1, which again leaves no doubt in our minds that Huebner finally regarded Knoch's *Epiphron* and Esper's (Fuessly's) *Melampus* as identical.

However, in Meigen's 'Syst. Beschreibung der Europ. Schmette.' (v. 1, pp. 137–138), published at Aachen and Leipzig in 1829, we find the separate identity maintained. The "species" are still some way from one another in the "omnibus" genus *Maniola* which is made to contain *Satyrus*, *Hipparchia*, *Eneis*, *Epinephele*, *Ceronympha*, *Erebia*, and *Triphysa*, and numbers altogether eighty-two members. "Bands on either wings with three to four white-pupilled eye-spots." But in the detailed account of *Epiphron* the white pupillation is assigned to the female only, though the illustration, which is poor (tab. xxxvi, fig. 2), looks as if it had been copied from Godart; that is to say the band on the fore wings is unbroken with four spots on the apical termination; the hind wings with six rings all white-pupilled. As for the figure of *Cassiope* (tab. xxxvii, figs. 1 a, 1 b), it is about as unlike any known form of that butterfly as possible, the blotches on the fore wings being lemon-yellow dusted with rusty red. The synonyms published refer back to the tenth edition of the 'Systema Naturæ,' 1, 5, 2297, 536, edited by J. F. Gmelin (Leipzig, 1788–1793). I have searched this work, but though the figures 1, 5, appear to refer to Part I, Order 5, the numbers 2297, 536, do not exist, and I suppose that is the reason why the reference is discarded by subsequent authors.

Four years after Meigen comes C. F. Freyer's 'Neuere Beiträge zur Schmetterlingskunde' (Augsburg, 1833 ?); and here once more there is no mention of *Epiphron*. *Cassiope* is the insect described (p. 37), and figured (tab. 20, fig. 1, male; 2 female), without the least trace of white pupillation in either sex; and as *Epiphron* is neither recorded in the text, nor figured on the plate, it is likely, too, that Freyer had come to the conclusion that the two were of one and the same species; though, of course, then, as to-day, the name *Cassiope*, as I contend, should have been employed for the blind-spotted female of *Epiphron*. Of *Cassiope* he says the native land is Switzerland, Hungary and Styria.

To sum up, then, the German authorities, from Knoch to Freyer, have gradually shifted their ground, though none of them vouchsafe a reason for the momentary elimination of *Epiphron* as a species from their works.

In the meantime, as the ardour of the German naturalist for the Macro-Lepidoptera begins perceptibly to diminish, and, if I may say so, the golden age of German lepidopterology draws to a close, the parable is taken up by a brilliant group of Frenchmen, while in England we have the first and best notice of

Epiphron, because it is the fullest, and marshals in detail the variation of the species as known to James Francis Stephens.

The annals of French entomology are exceptionally rich at this epoch: Godart, Duponchel and Boisduval are all at work upon native Lepidoptera, and the indefatigable collectors of Provence, the Comte de Saporta and Donzel, are providing material for the description of many butterflies hitherto unknown to the writers on this side of the Rhine. Godart and Duponchel, however, accept the original proposition of the German writers, and describe *Epiphron* and *Cassiope* as separate species (Diurnes, vol. ii, pl. xvi, figs. 3, 4). Of the former they write:

"Ailes entières, d'un brun noir, avec une bande ferrugineuse, maculaire; bande des supérieures offrant sur chaque face 2 à 4 points noir, pupillés de blane; bande des inférieures avec 3 à 5 en dessous. . . ."

Again the sexes are not differentiated, and it is permissible to suppose that once more it is a case of the authors merely quoting Knoch's original description. For, when we turn to the plate on which the male and the female are presented, we find an insect about twice the size of *Epiphron*, all four wings studded in the band with silvery white spots in both sexes. But this butterfly is certainly *Ceto*—a view which we shall presently see Boisduval holds, though Godart comes forward with the information that his *Epiphron* occurs in the Vosges, where *Ceto* has never been known.

"Ses ailes sont d'un brun noirâtre-chatoyant, et elles ont de part et de l'autre une bande ferrugineuse, plus ou moins longue légèrement divisée aux supérieures, maculaire aux secondes. La bande des premières ailes offre de deux à quatre yeux noirs à prunelle blanche. La bande des secondes ailes en à ordinairement trois en dessus, et de trois à cinq en dessous. Des Vosges."

Apparently at this time ('Hist. Nat. des Lépidoptères,' 1822) the existence of *Cassiope* in this region is unsuspected. "Il se trouve au mois de juin, dans les montagnes du Languedoc, et dans les Pyrénées-Orientales."

The description of *Cassiope* tallies closely with that of Fabricius:

"Ailes entières, d'un brun noir: les supérieures ayant de part et de l'autre une bande ferruginose, avec trois à cinq points noirs: dessous des inférieures plus pâle vers l'extremité, avec pareil nombre des petits points à iris rougeâtre. Dessus des ailes inférieures avec trois à quatre taches ferrugineuses, marquées chacune d'un point noir. Dessous des mêmes ailes d'un brun clair dans la femelle."

Alexis Noel's work, published at Paris in 1830 under the title, 'Collection Entomologique on Histoire Naturelle des Insectes,' consists entirely of plates, which are nothing remarkable in their

execution, and follow Duponchel's closely. All the same, on plate 34, liv. 5 partie 1, there is a fair representation of a male *Epiphron*, the chestnut band on the fore wings continuous with three black spots; the hind wings with four well-developed chestnut-ringed black spots, which suggest that the model was derived from the Vosges rather than the Alps.

Boisduval, in his 'Index Methodicus' (1829), divides the species and its near allies as follows:

<i>Epiphron</i> , F., Och.	Hircynia	. Julii.
<i>Ianthe</i> , H.		
<i>Pharte</i> , Esp., H., God.	Alpes . . .	Julii, Augusti.
<i>Melampus</i> , Esp., Och., God.	Alpes . . .	Julii.
<i>Cassiope</i> , F., H., Och., God.	Pyren. . . .	Julii.
Var. <i>Nelamus</i> , Bd. (Subcaeca)		
<i>Mnestrina</i> , Esp., H., Och., God.	Alpes . . .	Julii.
Var. <i>Mnemon</i> , Haworth	Alp. Scotie .	

In this classification the var. *Nelamus* makes its first appearance, laconically described as "almost blind" in the matter of the ocellation, the author apparently not having yet made the acquaintance of the form named years after *obsoleta* by J. W. Tutt.

Later, Boisduval, in his 'Icones' (p. 179, 1833), expresses himself somewhat forcibly both upon the views of the German writers and Godart's unhappy plate. "Fabricius and the German authors," he observes, "describe a species nearly related to this [i. e. *Melampus*] under the name of *Epiphron*. I very much doubt the authenticity of the pretended species, because all those I have received from Germany and other localities under the name of *Epiphron* have been either *Cassiope* or *Melampus*. As for Godart's *Epiphron* I don't know what he wished to represent; I think it must be *Ceto*." The plates in the 'Icones' devoted to the Erebias are extremely fine, and the copy before me has retained its primitive freshness of coloration.

Prof. Cantener ('Hist. Nat. Lépid. Rhopalocères des Départemens des Haut et Bas Rhin, de la Moselle, de la Meurthe, et des Vosges,' Nancy, 1834) continues the record (p. 134) as follows:

"*Nelamus*, Boisd., variété de *Cassiope*, Alpes de Dauphiné; Juillet, 'Ind. Method,' pag. 22, Boisd.

"*Epiphron* (i) Fab., Hyrcinie, Juillet, 'Ind. Method,' pag. 22, Boisd."

"(i) Nous croyons devoir d'autant plus signaler ici la doute que le Docteur Boisduval élève à la page 178 de son icones sur l'authenticité de cette espèce, que Godart l'indique comme appartenante aux montagnes des Vosges; sans affirmer positivement qu'elle ne s'y rencontre pas, nous devons dire que les renseignements qui nous ont été fournis par MM. les amateurs qui chassent habituellement dans ces contrées, ne portent pas qu'au nombre de cinq les espèces du genre *Erebia*, qui jusqu'à présent y aient été trouvées; ces espèces sont *Stygne*, *Medusa*, *Cassiope*, *Blandina* et *Ligea*"—

a statement which clearly indicates the absence of the white-pupilled form in the Vosges, and crystallises the opinions of contemporary entomologists that *Epiphron* and *Cassiope* are forms of one and the same species.

With regard to the occurrence of *Cassiope* in the Vosges Cantener adds in a note (*loc. cit.*, p. 136) :

"M. le professeur Schreiner est le premier, à ma connaissance, qui ait rencontré cette espèce dans nos montagnes. Depuis lors M. Darbas amateur zélé . . . l'a vu voler par milliers sur le Brézouar."

Meanwhile, *Cassiope*, Fabr., has been established as an English species quite dissociated from *Epiphron*, Knoch, and is duly figured and described by James Francis Stephens in his 'Illustrations of British Entomology, *Hausstellata*', 1829, and included in his 'Systematic Catalogue of the British Insects' of the same year, to which publications I shall refer more fully in that part of this paper devoted to the history of the butterfly in the United Kingdom.

Cassiope (*sic*) appears alone in the first account of the Silesian *Erebias* in the 'Syst. Verz. der Schmett. Schlesiens,' parts i, ii, by A. Neustadt and E. von Kornatzki, published at Breslau in 1812, with rough lithographic illustrations by A. Assmann. According to the legend, it is figured on the supplementary plate 41, and numbered 126 4a and 4b, with a further reference to plate 16, fig. 51, the preceding figure in that case being one of *E. melampus*. I cannot discover any description in the text of Assmann's *Cassiope*, which represents a small black *Erebia* with continuous bright yellow black-spotted bands on the fore wings, and an unbroken series of similar yellow-ringed black spots on the hind wings. The figures (upper and underside) are of males, but I have never seen examples of *Epiphron* or *Cassiope* the least resembling them in coloration. In the catalogue index of the work, p. vi, we are told that the species (*Cassiope*) occurs in July in the wooded marsh-region of the mountains. "Hitherto found only in the Altvater by Prof. Latzner and his pupils," thus extending the then known range of the species considerably eastwards.

Finally, Duponchel places *Epiphron* as a doubtful variety of *Cassiope* in his 'Catalogue Méthodique des Lépidoptères d'Europe,' Paris, 1844, where even the locality is changed, the Black Forest now taking the place of the Harz and the Vosges:

<i>Cassiope</i> , F., H., O., G., B. . . .	Alpes	JUILLET.
<i>Eriphile</i> , F.		
Var. <i>Nelamus</i> (presque aveugle)	Alpes du Dauphiné.	
Var. <i>Mnemon</i> , Haworth	Ecosse.	
Var. " <i>Epiphron</i> , F. . . .	Fôret Noire.	
<i>Junthe</i> , H., 202.		

But his views are not shared by Herrich-Schaeffer, who in the preceding or same year once more restores *Epiphron* to the rank of a species separate from *Cassiope*: while G. H. Heydenreich ('Syst. Verz. Europ. Schmett.,' second edition) in 1846 not only separates them, but attributes Knoch's name of *Epiphron* to Fabricius.

(To be continued.)

SOME NOTES ON THE COLLECTION OF BRITISH
MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT
OF THE OXFORD UNIVERSITY MUSEUM.

By F. C. WOODFORDE, B.A., F.E.S.

(Continued from p. 177.)

LYCENIDÆ.

Zephyrus betulae.—A long and fine series chiefly from Devon, Hants and Oxford, in all about 80, with only one remarkable aberration. This is a male specimen from the Spilsbury Collection in which the white line on underside of the fore wing is entirely wanting, as is also the outer white line of the hind wing. It has no data.

Z. quercus.—A fine series of upwards of 60, mostly bred chiefly from Devon, Hants and the New Forest. There are two indications of aberration, and both seem to be pathological. One is a ♂ bred by myself in the New Forest, and the other, unlabelled, from the Meldola Collection. In both the aberration is in one of the hind wings. A large proportion of the normally blue scales are white, giving a rubbed appearance, but a lens shows that this is not the case. In the New Forest specimen the aberration is on the right side, in the other on the left. In both specimens the shape of the affected wing is abnormal, the edge of the wing from the angle to the tail being straight instead of curved.

Thecla pruni.—Thirty specimens, labelled, from Northants, Huntingdon and Oxford. Twenty, unlabelled, from the Hope, Spilsbury and other Collections.

T. w-album.—A series of 45. Thirty, with data, from several localities.

Callophrys rubi.—A long series of upwards of 100. One underside from Cumberland, with a row of white spots in the fore as well as in the hind wings. Another has the underside altogether spotless; this is from Cornwall.

Chrysophanus dispar.—A very fine series of 27—14 male, 13 female. Most of them are in perfect condition, even with respect to antennæ. With them are two ichneumons, labelled by Prof. Westwood as "ichneumons of *C. dispar*." The species has not yet been determined.

C. virgaureæ.—A specimen, not in very good condition, from the Hope Collection, is the one referred to in Humphreys

and Westwood's edition, 1841, p. 98, and has a label to that effect by Prof. Westwood: "I possess a specimen given me by the late Mr. Haworth as an undoubted native specimen."

C. phœus.—A fine varied series of upwards of 150 from many localities. The chief aberrations are two ab. *alba*, Tutt, one taken near Oxford by Mr. W. Holland, the other from N. Staffs taken by myself. An ab. *cleus*, unlabelled, from the Spilsbury Collection, and another ab. *cleus*, from the Champion Collection, labelled "Milford, Surrey, July 29th, 1908." A very remarkable ab. *suffusa*, Tutt, taken in N. Staffs by Mr. H. E. F. Onions, August 5th, 1918. In this specimen the normal bright red of the fore wing is replaced by a pale buff colour along a narrow subcostal strip embracing the discal spots. The rest of the wing is deeply suffused with dark fuscous. In the hind wing the usual red band is buff coloured and much reduced in length and breadth. A very similar specimen, except that the ground-colour is more normal, was taken in the same locality, 1917, by myself. A fine ab. *radiata*, Tutt, Woking, August 13th, 1912, is from the Champion Collection, as is also a very fine ab. *juncta*, Tutt, taken near Woking. It approaches ab. *kochi*, two of the upper spots of the transverse set being elongated. There are also in the series several specimens of ab. *magnipuncta*, Tutt, ab. *parvipuncta*, Tutt, and ab. *intermedia*, Tutt, from various localities.

Plebeius aegon.—A long series of upwards of 100, but with very few aberrations. A series of 12 ab. *masseyi*, Tutt, from Witherslack. A remarkably dwarfed female specimen from the Meldola Collection, taken in Surrey, is no larger than a normal *Cupido minimus*.

Aricia medon.—A long series embracing all three forms—*medon*, *salmacis* and *artaxerxes*. One ab. *artaxerxes* is labelled "Durham, Castle Eden, capt. July 25th, 1893, by T. Maddison." In three specimens of ab. *artaxerxes* from Kincardine there is a black spot in the subterminal row of ocelli of the fore wing.

Polyommatus icarus.—A series of upwards of 190 from many English localities and from Scotland and Ireland. There are two ab. *icarinus* and three others closely approximating to that form. A remarkable pale lilac male, ab. *pallida* Tutt., from the Sellon Collection, is labelled "Grut's Collection." Two females are entirely blue except at the outer margins. Other female aberrations are too numerous for description.

Agriades bellargus.—A series of 67, all normal.

A. corydon.—A long series of upwards of 150. Two ab. *syngrapha* from Princes Risboro', 1917, taken by L. W. Newman. Ten semi-*syngrapha* taken at Royston, 1917. One ab. *corydonis*, Bergst., Princes Risboro'. Two female undersides, ab. *obsoleta*, also from Princes Risboro'. Another female ab. *obsoleta*, taken by Prof. Poulton near Reading about 1893. The above are the principal aberrations.

Celastrina argiolus.—A long series of upwards of 100, well illustrating the season dimorphism. The aberrations are few except in the size and number of spots on the underside, but there are two pinkish lilac males, ab. *lilacina*, Tutt, unlabelled, from the Spilsbury Collection. Also a female ab. *lilacina* from the Meldola Collection, but the usual black borders are light brown. Taken at Deal, August, 1901. A very remarkable male underside was taken by myself in the New Forest May 8th, 1915. The fore wings are spotless except for the central lunule, which is very faint, but in the hind wings the spots of the marginal row are elongated into streaks. In Tutt's 'British Lepidoptera,' vol. ix, pl. xviii, fig. 10, exactly represents the hind wings of this specimen, but has also the fore wings with spots and streaks. It is named *subtus-radiata*, Obth. This specimen might be described as ab. *subtus-partim-radiata*. A very minute female, smaller than many specimens of *C. minimus*, was taken by Prof. Poulton, August 6th, 1896, at St. Helens, Isle of Wight.

Cupido minimus.—A series of upward of 70 without any noteworthy aberration.

Nomiades semiargus.—A series of 12, most in very good condition, 5 from the Hope Collection, 4 from the Spilsbury, and 3 labelled "Grut's Collection" from the Sellon Collection.

Lycæna arion.—A series of 119. Twenty-nine from the Bude District, taken by myself, 41 also from the Bude District, taken by Mr. B. G. Adams, 29 from the Cotswolds in the Pogson Smith Collection. The rest without data. Except in the number and size of the spots the aberration is small. A male in the Pogson Smith Collection has only two submedian spots in the fore wings, and no spots in the hind wings. Of the small race there are 4 from Bude (2 males, 2 females), 3 from the Cotswolds (2 males, 1 female), 3 from the Hope Collection and 1 from the Spilsbury, the last 4 being all males.

HESPERIIDÆ.

Hesperia malvæ.—Series of upwards of 80. One specimen from the Sellon Collection labelled "Winchester" has an unspotted hind wing. Fourteen specimens exhibit every degree of modification from the type to the fully developed ab. *taras*. Of the remaining species of the Hesperiidae it need only be stated that all are well represented in the normal forms.

(To be continued.)

SOME MACEDONIAN MOTHS.

BY HERBERT MACE.

WHEN I say that the extremely small list of moths which forms the subject of this paper represents all the species I collected or made notes upon during the two years I was in

Macedonia, it will appear either that I was exceptionally indolent, or that the order is very poorly represented in Macedonia.

It is, of course, a fact that very little time could be employed in collecting, properly speaking, but this would not account for such a paucity of results. The main reason was that indicated in my paper on the butterflies—the impossibility of working at night. One could not, of course, potter about promiscuously with lights, so that the chief means of attracting moths were barred to me. Equally as important, however, is the fact that all the places at which I was stationed were remarkably open. Woods were non-existent and trees remarkably scarce. Even bushy ground, which affords much cover for moths in many places, was rarely encountered, and this accounts, I think, for the entire absence of many moths which are generally considered as universally abundant through Europe.

Chief interest attaches to the diurnal groups belonging to the Noctuae, most of which are unknown in Britain, and are, indeed, more distinctly Eastern, and I fancy that, should opportunity occur for someone to do systematic work in Macedonia, those groups would prove of exceptional interest as forming a strong connecting link between the Lepidopterous fauna of Europe and Asia Minor.

Zygaea pilosellæ.—Common in May in various places near Kukus.

Z. filipendulae.—Very abundant in May in the customary habitats of the genus. I saw no marked variation from the British forms, but noticed one feature which seems worth recording: On one hillside where the insects were exceptionally abundant there was a species of *Diauthus* with flowers of rich crimson, almost the exact shade of the insect, and these flowers were particularly favoured as alighting places. Either the insects mistook them for fellows of their own species or it is merely another example of protective resemblance.

**Procris pruni*.—Fairly common on hillsides near Kukus at the end of April and early May.

P. statice.—An abundant species, with a great range of variation, some forms being markedly bluish, while others were distinctly green.

Oenogyna parasitum.—One specimen only, found floating on a stream at the end of February (Sarigueul).

Arctia villica.—Several found at Kukus and Janes in May.

Coseinia striata.—Very abundant in a patch of rough grass near Kurkut in May, 1917. I took several striking varieties of the male, in which the fore wings were darker than normal and the hind wings entirely black.

Macroglossa stellatarum.—Extraordinarily abundant from March to November, and very interesting on account of its ubiquity and its marked indifference to the presence of man. I

was sitting on a hillside at Kukus one evening and within a foot of my head there was a large thistle, to which a *stellatarum* kept coming and going for half an hour, quite heedless of my presence. Its remarkable *penchant* for exploring dark holes in cliffs and excavations came particularly under notice. It seems hard to account for this habit, since neither flowers nor food-plant can possibly be found there. In the garden of a house I occupied at Armutci in the spring of 1918 I often saw these insects going into the pigeon-holes in the mud walls. Has it been suggested that the object of these visits may be the nests of bees? Numerous solitary bees occupy such places, and I have found even the hive-bee, *Apis mellifica*, inhabiting quite an open cave of this sort. *Acherontia atropos*, as is well known, enters and robs bee-hives. Why not *stellatarum*?

Acherontia atropos.—I found several larvæ of this on the *Datura stramonium* in November, 1917, but did not succeed in rearing them. One was the remarkable white variety with sepia dots in two shades. I saw two or three specimens of another *Sphingid* during July, 1918, at Gerbazel, but did not succeed in capturing them, nor can I be sure of their identity. The species was either a *Chærocampa* or *Deiliphila*. The remarkable feature was that it was flying freely in full sunshine. Perhaps someone knows of a species with this habit, which was new to me?

Saturnia paronia major.—I took a larva of this great insect on a willow at Yenikeuy in July, 1917, but it got out of the somewhat crazy box and spun up in my mackintosh cape. I tried not to disturb it, but ultimately it was unavoidable and the thing went under. A specimen of the moth was brought to me for determination in the spring of the following year.

S. spinii.—Several taken at Kukus and Janes in April.

Odonestis potatoria.—One found at Doiran, September, 1918.

Crateronyx taraxaci.—On Janes plain I used to find many of these at rest on the herbage in the early morning (November).

Cossus cossus.—I saw a number of Turkey oaks with the characteristic borings in January, 1917 (Sarigueul).

Hepialus lupulinus.—Fairly common on the hillsides at Janes in April and May.

**Evergestis frumentalis*.—A few found flying amongst rough herbage at Kukus at the end of May.

Dianthœcia albimacula.—One or two flying round fennel at Janes (September).

Plusia gamma.—Common at Armutci from the beginning of May through the summer.

Chariclea delphinii.—One or two at Armutci (May).

**Janthinea frivaldskyi*.—I took two specimens of this exquisite little insect, which does not appear to have been recorded from Europe before, flying round the flowers of *Fumaria*, which was an extraordinarily abundant weed in some potato-fields at Armutci.

Its rich purple and blue colouring harmonised delightfully with the flowers. They were flying in the hottest part of the day (May 3rd). Although I kept a sharp look-out for the rest of the month I did not meet the species again.

Emmelia trabealis.—Common over a rough hedge at Armutci (May).

Acontia luctuosa.—Kukus and Armutci (end of May).

A. lucida.—Kukus (end of April). One only.

Anthophila purpurina.—One specimen of this lovely pink-blushed moth taken in a ravine near Kurkut (May 12th, 1917).

**Metaponia subflava*.—Common at Armutci early June. I saw many pairs flying about the flowers of *Delphinium consolida* in the early morning.

Catocala puerpera.—Resting on shady rocks at Yenikeuy (August).

**C. courversa*.—One found at Kukus (end of June).

Lencanitis stolidula, *Grammodes geometrica*, *G. algira*.—These three insects, which closely resemble each other in appearance and habits, were found freely in shady ravines in September. They have a singular and unmistakeable habit of dashing swiftly, without apparent reason, from one place to another, invariably settling on the bare ground, where they are not easily detected.

Nychiodes liridaria.—One found at Janes (May).

**Eucrostis indigenata*.—One specimen only. No data.

**Idea rubiginata*.—Common at Kasimli (end of June).

I. ornata.—Kukus and Janes (May and September).

A. imitaria.—In ravines, Janes (June).

Timandra amatoria.—Common in ravines (June).

Rhodostrophia calabria.—Flying over long grass on hilltops in the evening. Kukus and Janes (May and June).

Lythria purpuraria.—Very common over waste ground near Yenikeuy (end of July).

Aspilates ochrearia.—Common near Irikli (May).

Camptogramma bilineata.—A few found in ravines (May).

Anaitis plagiata.—On hillsides at Yenikeuy (end of July).

Chesias farinata.—One. No data.

Pyralis farinalis.—One.

**Botys moldavica*.—Abundant on a hilltop at Kukus (end of May). Flying over rough herbage in the evening.

B. hyalinalis.—One only, Yenikeuy (end of July).

Hydrocampus nympharata.—In ravine at Gerbazel (June).

Acipitilia pentadactyla.—Over waste ground at Kukus (end of May).

Myelophila cibrum.—Round thistles, Janes (May).

Pseudaia bipunctella.—One on elm-trunk, Armutci (April).

The above list, imperfect as it must necessarily be under the circumstances of observation and collection, discloses this interesting fact : Mr. Rowland-Brown and others who hav-

interested themselves in the Lepidoptera of Southern Macedonia have professed themselves struck by the "western" aspect of the butterflies. I submitted a few species unknown to me to Mr. Tams, the Curator of Heterocera at the Natural History Museum, and he kindly identified them, with the remark that those marked with an asterisk in the above list are species usual to Armenia, so that, whatever may be the case with the Rhopalocera, it is obvious that the western-oriental species of Heterocera extend at least as far west in this direction to the region indicated.

Faircotes, Harlow.

NOTES ON BRITISH ODONATA, 1919.

By W. J. LUCAS, B.A., F.E.S.

PERSONALLY the dragonfly season of 1919 commenced on April 22nd, when I saw an example of *Pyrrhosoma nymphula*, Sulz. at Marlborough Deeps in the New Forest; but after that date a long break occurred before I met with a dragonfly again. The season, for myself, ended early also—on October 4th—though there is no reason to doubt that examples of one or two species lingered on as usual into November.

ÆSCHNIDÆ.—*Gomphus vulgatissimus*, Linn. was not met with as an imago at all during the season, but an empty nymph-skin was obtained at Apsley Passage of Oberwater in the New Forest. It was found upon a bare spot on the bank, as was to be expected, for the build of a *Gomphus* nymph makes climbing a reed or stick to all appearance an impossibility. *Cordulegaster annulatus*, Latr. (one male) was reported from Aber-edw in Radnorshire—apparently the first time that a dragonfly has been notified from that county (H. Bendorf). This species was taken on June 28th in Devon at Dartsmeet, Dartmoor (R. N. Goodman). One was met with near Hawkshead in Lancashire between June 19th and July 15th (O. Whittaker). One or two were observed at Newquay in Cornwall (C. W. Bracken). On July 31st in the New Forest I frequently saw males. Females are less often seen than males, and I did not notice one of the former sex till August 3rd. This one was ovipositing in the margin of Blackwater in the New Forest under alder and other vegetation. I discovered its presence by the sound produced, which seemed at first like the song of some unknown grasshopper. When the dragonfly came out from cover I caught it, but, finding a wing damaged, set it free: males were again plentiful that day. The last example of *C. annulatus* that I saw was one at Blackwater on September 6th. *Brachytron pratense*, Müll. was taken (a teneral female) at Hickling in Norfolk between May 24th and 28th, and a nymph-skin, no doubt of the same species, was also secured (T. A. Coward).

A male of *Aeschna grandis*, Linn. was captured between June 8th and 16th near Drumreaske in Co. Monaghan in Ireland (Goodman); and several were seen in September at Sudbury in Suffolk along the River Stour, as well as one hawking round a tree in the garden towards dusk while it was raining fast (B. S. Harwood). On August 15th *A. juncea*, Linn. was seen at Loganlee in the heart of the Pentlands (W. Evans). *A. cyanea*, Müll. was met with on August 1st in Alice Holt in Hampshire as well as in other localities in the neighbourhood (E. A. C. Stowell); in the New Forest on September 5th (Lucas); and at Sudbury (Harwood). *Anax imperator*, Leach was sighted in Princes Coverts near Claygate in Surrey on June 7th, and the same species was frequent at the Black Pond on Esher Common in Surrey on the 10th, while on the 14th it was seen flying over a small pond on Effingham Common in Surrey (Lucas). In June it was plentiful at Yateley in Hants (G. T. Porritt). On June 21st it was met with at Boldermere near Wisley in Surrey (Lucas), and on July 9th in Alice Holt (Stowell), while on August 13th it was recognised at some pools (no doubt brackish) on the shore near Mudford in Hants (Lucas). As late as September 1st a somewhat worn male *A. imperator* was taken by the side of Crockford Pond on Beaulieu Heath in the New Forest (Lucas).

LIBELLULIDÆ.—On June 7th *Cordulia æneæ*, Linn. was seen in Princes Coverts, while on the 10th it was frequently seen at the Black Pond, when two males were taken; on the 21st it was noted at Boldermere (Lucas). *Libellula quadrimaculata*, Linn. was captured on May 24th near Cadbury Camp in Somerset, and was seen there again on the 31st flying high round some oaks catching flies (T. F. Hewer). Early in the season E. R. Speyer met with the species frequently near Shenley in Herts, and thought there might have been an immigration. On June 10th it was very common at the Black Pond, when two examples of var. *prenubila*, Newm. were seen, one being secured (Lucas); on the 14th it was observed on Effingham Common (Lucas). It was met with at Alton, and on May 27th at Hampage Wood near Winchester, both in Hants (Stowell). Both sexes were taken between June 8th and 16th near Drumreaske, Co. Monaghan, in Ireland (Goodman). On June 21st an example of var. *prenubila* as well as the ordinary form were noted at Boldermere (Lucas). From July 23rd–25th the same species were found at Wellington College in Berks (Harwood). A very teneral male of *Libellula fulva*, Müll. was taken at Hickling in Norfolk between May 24th and 28th (Coward). Early in the season Speyer found *Libellula depressa*, Linn. to be very frequent at Shenley, so much so that he thought there must have been an immigration accompanied by a smaller number of *L. quadrimaculata*, though there was no direct evidence of this having occurred. It was noted in Princes

Coverts on June 7th, on Esher Common on June 10th, and on Effingham Common on June 14th (Lucas), on May 21st at Alice Holt, and at other places in the neighbourhood later (Stowell), also at Sudbury in Suffolk and at Colchester and Alresford in Essex (Harwood). Bendorf captured *L. depressa* at Aber-edw. On June 28th *Orthetrum cærnescens*, Fabr. was taken at Dartsmeet, Dartmoor (Goodman); from July 23rd to 25th it was seen at Wellington College (Harwood); it was fairly abundant at Newquay (Bracken).

Stowell found *Sympetrum striolatum*, Charp. in teneral condition at Kingsley Pond near Alton on July 11th, while later they were numerous and showy all over the heath; in Scilly it was not uncommon in July along roadsides (Blair); on August 13th it was observed over pools by the shore near Mudeford (Lucas); a few were noticed near Newquay (Bracken). Stowell met with *Sympetrum scoticum*, Don. at Kingsley Pond on August 18th, and I found it on October 4th at the Black Pond—the last dragonfly I saw during the season. On August 30th three examples of *Sympetrum sanguineum*, Müll. were taken between Baildon and Hawkworth in the Bradford District of Yorkshire, this capture constituting a new record for the county (Morrell).

CALOPTERYGIDÆ.—*Calopteryx virgo*, Linn. was very plentiful in June at Aber-edw, one female being very dark, while some of the males had the tip and base of the wings nearly hyaline (Bendorf); in the same month it was swarming by the River Wey at Bentley, etc., in Hants (Stowell); on June 28th it was taken at Dartsmeet (Goodman): it was noted at Sudbury in June (Harwood). In the New Forest, towards the end of its season, *C. virgo* was seen in decreasing numbers from July 26th till August 15th, after which none were noticed (Lucas). Bendorf found *Calopteryx splendens*, Harris at Aber-edw, but less abundant than its congener, and stated that the birds did a fair amount of destruction amongst them, as seen by the wings left lying about on the ground. On June 10th *C. splendens* was fairly numerous at the Black Pond, and as one seemed to be a female they may be breeding there, although a pond is not usually chosen by the species (Lucas). In June it was found in numbers with *C. virgo* by the Wey at Bentley (Stowell).

LESTIDÆ.—A very teneral example of *Lestes sponsa*, Hans. was found at Boldermere on June 21st (Lucas), and one or two individuals were noted at Wellington College from July 23rd to 25th (Harwood).

AGRIONIDÆ.—*Ischnura elegans*, Lind. var. *rufescens*, Leach was captured at Old Quay Canal, Cheshire, on June 1st (C. Madeley). The normal form was taken near Tilford in Surrey on June 21st, and at Kingsley Pond on July 11th (Stowell); in the Scilly Isles this species was found locally in a marsh in July (Blair); it was taken at Wicken Fen on August 4th (G. T. Lyle);

and was last noticed on August 15th in the New Forest (Lucas). In 1919 *Ischnura pumilio*, Charp. again eluded notice. On May 24th Coward was fortunate enough to secure at Hickling Broad a few of both sexes of *Agrion armatum*, Charp., but unfortunately did not recognise his captures at the time : he was, however, good enough to add a pair to my collection. At Hickling he also took a male *Agrion pulchellum*, Lind. between May 24th and 28th. Of the last-named species Goodman took a very teneral male between June 8th and 16th near Drumreaske, while Stowell captured it at Alice Holt on the 26th of the same month. On July 25th I found *Agrion mercenariale*, Charp. numerous in the New Forest at Oberwater near Apsley Passage, most being males ; on the 28th at Duck Hole Bog they were common but only one female was seen ; on August 2nd they were again plentiful at Oberwater and one female was captured ; they appeared to be still plentiful there on August 6th, but when sought for some time later none were seen. On May 31st a female of *Agrion puella*, Linn. was taken in Juniper Valley on Boxhill, whither it had probably come from some distance (L. C. E. Balcomb) ; a male was captured at Aber-edw in June (Bendorf). In Cheshire Madeley took a female at Runcorn on May 19th, a male at Old Quay Canal on June 1st, and a somewhat teneral male at Stretton Moss on June 9th. It occurred at Alice Holt on May 21st and subsequently at many places near (Stowell). The same species was taken at a small pond on Effingham Common on June 14th, at Boldermere on June 21st, and at Bishop's Dike in the New Forest on August 9th (Lucas).

Pyrrhosoma nymphula, Sulz. is probably our earliest dragonfly and I first saw it, as already mentioned, in the New Forest on April 22nd. Between May 24th and 28th Coward took teneral and full-coloured specimens at Hickling. On the 30th of the month Evans found it in considerable numbers at Auchincorth Moor in Midlothian. In June males were taken at Aber-edw (Bendorf). Both sexes were found at Runcorn on May 19th and males at Stretton Moss on June 9th (G. A. Dunlop). From June 8th to 16th both sexes occurred at Drumreaske (Goodman). It was taken at Boldermere on June 21st (Lucas). On July 25th this dragonfly was numerous in the New Forest and many were noticed connected *per collum* : it was observed there subsequently on July 30th and 31st, and on 1st, 6th, 11th, and finally August 15th, being therefore seen on the wing practically four months (Lucas). Males of *Enallagma cyathigerum*, Charp. were taken at Hickling between May 24th and 28th, having the black spot on the second segment of varying forms, one with a straight fore margin, causing the spot to resemble a goblet. A teneral female was captured on May 31st in Juniper Valley on Boxhill, and therefore some distance from water (Balcomb). Males, one extremely teneral, occurred at Aber-edw in June (Bendorf). The

species also occurred at Effingham Common and East Horsley in Surrey on June 14th (Lucas); males near Drumreask from June 8th to 16th (Goodman); near Hawkshead plentifully from June 19th till July 15th (Whittaker); at Boldermere on June 21st (Lucas); in Alice Holt on June 28th and at Kingsley Pond on July 11th (Stowell); and at Wicken Fen on August 4th (Lyle). One of the specimens taken at Alice Holt had the black spot on the second segment of a very strange shape. It consisted of a somewhat coarse U as in *A. puella*, with an elliptical spot nearly filling up the space between the prongs. It somewhat suggested a combination of *A. puella* and *E. cyathigerum*, which, since both were present at the same pond, is just possible but not very likely.

28, Knight's Park,
Kingston-on-Thames.

NOTES AND OBSERVATIONS.

COLIAS EDUSA, ETC., IN HAMPSHIRE.—On Sunday, August 8th, I took a specimen of *C. edusa* near Winchester, also a splendid specimen of var. *helice*, the hind wings of which are unusually blue. *Atalanta*, *Io*, and *Cardui* are very abundant this year, and *Polychloros* is also quite in evidence. I have bred a large number of *Io* (wild), and not one has been ichneumoned.—W.M. PIERCE; Queen's Road, High Wycombe, Bucks.

COLIAS EDUSA IN SOUTH HAMPSHIRE.—*Colias edusa* has been quite abundant on the downs here during the past week. On Sunday, August 8th, when I was cycling in another locality twelve miles away I observed several in the lanes. Only two *C. hyale* have come to my notice.—A. T. POSTANS; 148, Fawcett Road, Portsmouth, August 12th, 1920.

NOTE ON PIERIS BRASSICÆ.—I wish to mention the finding of *P. brassicæ* on two occasions in my house. Whilst clearing an upstairs room on May 12th (1920) I found a male specimen, and on May 25th I found a female specimen on the curtains of the front room. Both were perfectly fresh specimens, and the dark marking on wings a very deep black. Both forms were large. It seems strange to account for them being in the house, for I have not bred the species this year, and gardens are scarce in the middle of the city. *A. urticae* was seen flying in Abbey Park, Leicester, on April 24th (1920).—G. U. WARNER; 47, Chester Street, Leicester, July 9th, 1920.

LIMENITIS SIBYLLA IN SURREY.—On July 27th I took a specimen of *Limenitis sibylla* flying around the birches on Wimbledon Common.—L. COUCHMAN; Beechworth Lodge, West Heath Road, Hampstead, N.W. 3.

LIMENITIS SIBYLLA, LINN., IN SURREY.—For the sake of the locality it may be worth recording that while I was collecting dragonflies near

Byfleet on August 16th, a large White Admiral butterfly made its appearance over the tow-path beside the Basingstoke Canal. A capture was made, and when examined by Mr. Norman D. Riley the specimen proved to be of the female sex.—F. W. CAMPION; 58, Ranelagh Road, Ealing, July 26th, 1920.

PYRAMEIS ATALANTA IN SCOTLAND.—I was both pleased and surprised to see, on Saturday last, flying at the roadside between Blair Atholl and Glen Till, *Pyrameis atalanta*. I was near enough to it to note its wasted condition. *Aglais urticae*, much worn, was seen at the same time.—F. G. WHITTLE; Struan Inn, Catrine, Perthshire, July 6th, 1920.

DEILEPHILA LIVORNICA IN SOMERSET.—On May 10th of this year my youngest son brought me a fine specimen of the above which he had found at rest on the road just outside my gate.—G. B. CONEY; The Hall, Batcombe, Bath.

DEILEPHILA LIVORNICA—A VINEYARD PEST.—In relation to the several reports received of the occurrence of this Sphingid in the South of England this season, it seems that the migration has been from the South of France, where it was exceedingly abundant last year. Writing in the 'Bulletin de la Société Entomologique de France' (No. 12, 1920, pp. 201-2), M. F. Picard says—" *D. lineata livornica*, Esp., usually very scattered in the South of France, made its appearance (in 1919) in considerable numbers in the vineyards round St. Tropez (Var), and devastated them. The young vines newly grafted were worst attacked. This invasion recalls in its intensity that which occurred in Algeria in 1904." M. Picard also denounces the larva of *Culocampa eroleta* as a special vine-pest in the neighbourhood of Beziers (Hérault), but, as he points out, this species is by no means peculiar to the vine, but is polyphagous. H. ROWLAND-BROWN; August 2nd, 1920.

EPINEPHELE TITHONUS AB. ALBIDA IN ISLE OF WIGHT.—I have pleasure in recording the capture by myself on August 16th of a specimen of *E. tithonus* ab. *albida* on downs near Ventnor. I believe that this form of the species is very rare in England. The specimen taken was a male in fine condition except for loss of half its left antennae. It also has six spots on underside of hind wing.—ERNEST CORNELL; Burmah, Newport Road, Ventnor, August 18th, 1920.

ACRONYCTA ALNI, LARVA.—On July 25th last I took a full-grown larva of *Acronycta alni* on a sapling of *Betula alba*, that was growing by the roadside about half-a-mile to the north-east of Bransgrove. The sun was shining, but half-an-hour previously it had been raining. It is the first specimen I have so far taken in this district.—OLIVER GATTY; Beech House, Christchurch, Hants.

CATOCALA FRAXINI IN KENT.—On July 24th last I took a very fine specimen of *C. fraxini* in the neighbourhood of Dartford. It was resting on the trunk of an apple-tree.—J. M. JAQUES; The Red House, Banstead, Surrey.

THAMNOPTERA (ITALIA) BRUNNEATA AT WICKEN IN JUNE.—The most interesting event of a very enjoyable time spent by Mr. G. B. Coney and myself at Wicken from June 14th to 26th this year was

the capture of two specimens, at light, of *Thamnonoma brunneata*, the first by myself on June 16th, and the second by my friend on June 19th. Till then we believed it to be confined to the highlands of Scotland, but we hear that it has been recorded in the August number of the 'Entomologist' as having been taken in Staffordshire on June 18th and 19th.—A. P. WICKHAM; East Brent, Somerset.

A VISIT TO WICKEN, JUNE 14TH TO 26TH, 1920.—At first dusking and light were our most productive methods, sugar proving quite unattractive, but after the first few nights we had plenty of sport at the sugar patches as well as at the sheet. Other insects noted or captured included the following: *Papilio machaon*—nearly over; a few good specimens taken also at the end of our time, a few larvae, then very small. *Sphinx ligustri*, *Chærocampa elpenor*, *Smerinthus ocellatus*, *Earias chlorana*, *Nudaria senex*, *Phragmatobia fuliginosa*, *Spilosoma urticæ*, *Macrogaster castaneæ*—fairly plentiful at light, also dusking among reeds. Three ♀ taken off reeds, two flying at dusk, and two at the sheet—*Cosmotriche (Odonestis) potatoria*, one ♂ pale variety, *Cerura furcula* (on wing, dusking), *Pterostoma palpina*, *Notodonta ziczac*, *Palimpsestis (Cymatophora) octogesima*, *Arsilonche albovenosa*—not plentiful, about one dozen—*Leucania obsoleta*, *L. impudens*, *L. comma*, *L. impura*, *L. straminea* (fairly common among reeds), *L. pallens*, *Meliana flammea* (scarce after first few nights), *Senta maritima*, *Cænobia rufa*, *Neuria reticulata* (scarce at sugar), *Mamestra sordida*, *Apamea unanimis* (fairly common but generally badly worn), *Agrotis corticea*, *Noctua festiva*, *Triphaena subsequa* (one at sugar, June 25th), *Dianthæcia capsincola*, *Aplecta advena*, *Hadena dissimilis*, *H. thalassina*, *H. pisi*, *Plusia festucæ*, *Bankia argentula* (plentiful enough to make a visit to Chippenham unnecessary), *Hydrelia uncula*, *Herminia cribralis*, *Epione apiciaria*, *Hyria muricata*, *Acidalia immutata*, *Eupithecia succenturiata*, *Collix sparsata* (Mr. Coney took thirteen at one spot one night), *Lobophora sexalisata*, *Phibalapteryx vittata*, *Scotosia vetulata*, *Cidaria dotata*, *C. associata*, *Pelurga comitata*, *Naxia ciliaris*—plentiful at light June 14th, scarcer later—*Chilo phragmitellus*, ♂ plentiful, ♀ scarce, *Schæbius mueronellus*, *S. gigantellus*, *Crambus uliginosellus*, *Pterophorus monodactylus*, *Platyptilia ochrodactyla*, *Leioptilus microdactylus*, *Cataclysta lemnata*, *C. stratiolata*, *Hydrocampus nymphæata*, *H. stagnata*, *Tortrix costana*, *Anysychia funerella*. Two visits to Tuddenham, June 17th and 21st, secured us the following insects: *Hecatera serena* (on the way there on a paling at Freckenham), *Heliothes dipsacea*, *Agrophila trabealis*, *Acontia luctuosa*, *Acidalia rubiginata*, *Lithostege griseata*, *Spilodes verticalis*, *Orobena extimalis*, *Crambus chrysonuchellus*, *Homeosoma sinuella*.—A. P. WICKHAM; East Brent, Somerset.

NEMORIA VIRIDATA IN SUSSEX.—It may be of interest to readers to know that during late May and early June this year I took *Nemoria viridata* here plentifully; though I have not seen any record of it from East Sussex, I think it may be worth recording. Also on March 18th of this year I took the Gynandromorphous *Hybernia marginaria*, which Mr. Newman exhibited at the South London

Entomological Society meeting mentioned in your June number (*antea*, p. 143). It is now in the Natural History Museum at South Kensington.—STANLEY N. A. JACOBS; High House Farm, Chailey, Sussex.

Zygæna hippocrepidis IN SOUTH HAMPSHIRE.—I have much pleasure in recording an almost pure colony of *Z. hippocrepidis* (Stephens) for this district of Hampshire. In early July of this year I collected casually a number of *Zygæna* cocoons, which I thought were ordinary *filipendulae*, hoping to obtain varieties later of that species. I was agreeably surprised, therefore, when no less than 90 per cent. of the cocoons produced very fine and undoubtedly *Z. hippocrepidis*. Only 10 per cent. were true *filipendulae*. I have no knowledge of a May-June emergence, as I have not been on this particular ground at that time of the year. Such a high percentage of *hippocrepidis* in late July strikes me as remarkable, as I have always understood that the hybrid occurs chiefly in May and June. From my own observations I believe that *hippocrepidis* not only pairs with its own kind, but also that such pairings are undoubtedly fertile, and therefore has the power of carrying on from season to season a colony of its own. That the sexes of *hippocrepidis* do pair I think most entomologists who have made its acquaintance are agreed upon. As proof, however, I quote the following instance that occurred to myself. It is invariably my custom to leave all insects that emerge from pupae in my cages for twenty-four hours, so that the wings may be perfectly dry before I introduce their owners to the killing-bottle. And so with the *hippocrepidis*; and after they had emerged, which always happened during the early morning, and had dried their wings, I always found the sexes paired freely some time during the day, and one batch of ova that I kept for observation produced larvae later.—A. T. POSTANS; 148, Fawcett Road, Portsmouth, Hants, August 9th, 1920.

NOTES ON INSECTS IN LONDON SUBURBAN GARDENS.—The Tortrix Moth *Sericoris littoralis* was very common in my garden last June. It is generally referred to as a coast or salt marsh species, the larva feeding on flowers of *Statice armeria*. Some Thrift in the garden accounts for its presence. The larva is pale dingy green with a shiny dark brown head and black plate on 2nd segment. Amongst other insects taken and not usually associated with a garden was a male of the fine dragonfly *Eschna grandis*. This is the only dragonfly I have seen in this garden. There are no ponds near, and I think it must have come from Wanstead Park, a mile or more away. *Fornax jaculator*: Several flying about flowers. The ovipositor of the female is as long as the insect. This belongs to the *Evaniiidæ* division of the *Ichnemmonidæ* distinguished by the abdomen being inserted upon the back of metathorax. Said to be parasitic on other Hymenoptera. I ascertained the name by referring to Curtis's 'British Entomology,' vol. ix, at the Guildhall Library. See also 'Entomologist,' vol. xiii, p. 253. *Pyrausta punicealis*: Larva feeds on garden mint, greenish with black spots, usually found on chalk downs. *Hyponomeuta eronymellus*: Frequent on garden *Euonymus*. It is usually found on wild *Euonymus* or spindle-tree. Referring to

this genus, has *H. irrorellus* been observed lately. Many years ago I bred a specimen from a solitary larva feeding on the seed-head of an Umbelliferous plant, *Anthrixus sylvestris*, at Greenhithe. In 'Stainton's Manual' the food-plant is given as spindle.—W. PASKELL; 85, Second Avenue, Manor Park, E. 12, August 10th, 1920.

LARGE ATLAS MOTH FROM THE MALAY PENINSULA.—In the 'Entomologist' for 1916, p. 233, I recorded a particularly large example of *Atlas attacus* from the Himalayas. This was a female, measuring just over 11 in. from tip to tip of the wings. The largest recorded by Hampson in the 'Fauna of British India' is under 10 in. Last week I saw in the Federated Malay States Museum at Kuala Lumpor a particularly large male which measures exactly 10½ in. across. It was taken in Kuala Lumpor (the capital of Selangor, Malay Peninsula). The measurement is perhaps worth recording, if only in the hope of drawing further records of perhaps yet larger specimens.—J. C. MOULTON (Major); Singapore, Straits Settlement.

SPHECOLMYA INANIS, FLN.—I am entirely with Dr. Meade when he terms ('Descrip. List Brit. Anthomyidae,' 1897, p. 19) "this peculiar fly" "not common." I have been on the look-out for it for thirty years, and to-day, having found it, I make a note of it. This garden has been continuously "worked" for sixteen years, yet no specimen has previously been noticed. At 2.45 (true time) I was passing along the most shady part of all, a narrow bye-path so dark that no plants but ivy will cover the ground beneath interlaced shrubs overhead, when *S. inanis* appeared on a level with my eyes, seated conspicuously high on its unusually long legs upon a Laurestinus-leaf, covered with honey-dew from the aphides (*Chaitophorus aceris*, L.) on the overhanging maples. Politically I gave it no second glance—what is the curious power of our eyes that frightens insects?—but silently turned back to the house, some hundred yards, for a net, and was rejoiced to find *S. inanis* unmoved upon my return. I moved it, and found it a fine male. It was first found in the County by Tuck, who bred it at Tostock in 1896 ('Ent. Mo. Mag.,' ann. cit., p. 155) from the nest of *Vespa germanica*, whence I suppose came Meade's "The larvae have been found in wasps' nests." Bennett told me he took it in 1908 near Ipswich, where I failed to find it in a dozen years' collecting, 1892–1904. Elsewhere Bloomfield records it vaguely from "Norfolk"; Malloch ('Ent. Mo. Mag.,' 1909, p. 41) took "1 male in Murroch Glen in August" in Dumbartonshire during 1908: and twenty years ago Adams gave me a male he had taken in his "fly-trap" at Clay Hill in Lyndhurst on July 19th. Further west Dale in 1878 says it is "very rare" at Glanvilles Wootton—all which shows that it has a pretty broad distribution with us.—CLAUDE MORLEY; Monks Soham House, Suffolk, June 27th, 1920.

ODONATA AND NEUROPTERA OF LANCASHIRE AND CHESHIRE.—The Lancashire and Cheshire Fauna Committee have published papers by Mr. W. J. Lucas on *Leucorrhinia dubia*, Vand., and on the Odonata and Neuroptera of the two counties. With the former is a reproduction, in plate form, of the author's drawing of the nymph of *L. dubia*.

ÉTUDES DE LEPIDOPTÉROLOGIE COMPARÉE.—In an article entitled "Nature Study and War," the writer, a member of our staff, reviews at length Mr. Oberthür's classic work in 'The Times Literary Supplement' of Thursday, August 26th.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, April 7th, 1920.*—Mr. W. G. Sheldon, F.Z.S., Vice-President, in the Chair.—Mr. C. F. C. Beeson, Indian Forest Service, Forest Recorder Institute, Dehra Dun, U.P., India; Capt. Bushell, Imperial Bureau of Entomology, Natural History Museum, South Kensington, S.W. 7; Major H. C. Gunton, M.B.E., Hobart, Gerrard's Cross, Bucks; Messrs. Owen Huth-Walters, M.A., Knoll Cottage, Ufford, Woodbridge, Suffolk; Percy I. Lathy, Curator to Mme. Hornack-Fournier, 90, Boulevard Malesherbes, Paris; and Prof. Benedicto Raymundo, Director of the Museum of the Agricultural Society of Rio di Janeiro, Rio di Janeiro, Brazil, were elected Fellows of the Society.—Exhibitions: Mr. Bedwell exhibited a specimen of the beetle *Otiorrhynchus ligustici*, L., taken near Ventnor, one of the rarest of the British weevils, of which there has been no recent record.—Dr. J. C. Mottram, F.Z.S., and Dr. E. A. Cockayne, D.M., gave a demonstration of fluorescence in Lepidoptera by ultra-violet radiation. In view of the interest which physicists have taken in the brilliant coloration of many birds and insects in an endeavour to explain them, the examination in ultra-violet radiation would go far to decide whether or no fluorescence played any part in these brilliant colours. The first insects examined were various Lycaenidae and other iridescent species, it having been suggested that their colour is due to a fluorescent pigment, including *Agriades coridon* and *A. thetis* and a *Morpho*, as examples of iridescent blues. Purples and purplish-blues were represented by *Apatura ilia*, *Terinos poros*, *Isamia superba*, *Elymnias casiphone* and the Castniid moth *Cyclosia ampliatum*, copper by *Chrysophanus rutilus*, *Rumiccia phleas* and a male *Zeyris chrysomallus*, and blue-green and green by *Papilio blumei*, *Zygaea filipendula*, *Ino statices* and others. Some Pyrales, which showed a mother-of-pearl iridescence, the pearly underside of *Agraulis renilia*, and the metallic *Plusia festucæ*, *P. chrysitis*, *P. moneta* and *Spatialia phisiotis* had been examined, but none of these showed any fluorescence. Later on most of the British moths and a large number of tropical butterflies and moths belonging to widely different groups had been tested, but only a very small proportion proved to be fluorescent. The discovery raises the question of whether the fluorescence is of any value to the insects. It is generally accepted that the male of *Hepialus humuli* is coloured white in order to attract the female during his hovering flight at dusk. The fact that the white is fluorescent probably aids the female, which is non-fluorescent, in her search. It is interesting that the white males from the Shetlands are much less fluorescent

than English ones, those with red markings on a white ground only very slightly fluorescent, and those coloured like females are non-fluorescent. It is so light when the males fly in the Shetlands that the white coloration and fluorescence are not of much use. In the case of the Geometers both sexes are equally fluorescent. All are light-coloured and therefore conspicuous on the wing at dusk, and their fluorescence must add to their visibility.—The Secretary read a letter from the Essex Field Club protesting against a Parliamentary Bill for the permanent alienation of parts of Wanstead Flats and Epping Forest for allotments, and on his motion, seconded by Lord Rothschild, it was unanimously resolved to send a letter in similar terms to the Prime Minister, and others who might be interested in supporting the protest.

Wednesday, May 5th, 1920.—At the Special Meeting Comm. J. J. Walker, M.A., R.N., F.L.S., President, in the Chair.—Mr. G. T. Bethune-Baker proposed that the suggested alterations in the Bye-laws be received. This was seconded by Lord Rothschild and carried. The suggested alterations were then put separately before the meeting from the Chair. At the Ordinary Meeting which followed, M. F. le Cerf, Curator of the Lepidoptera in the Paris Museum, 13, rue Guy de la Brosse, Paris, Miss Alice Ellen Prout, Lane End, Hambledon, Surrey, and Messrs. W. H. Tams, 8, Whitla Road, Manor Park, E. 12, and Alfred E. Tonge, Ashville, Trafford Road, Alderley Edge, Cheshire, were elected Fellows of the Society.—Lord Rothschild, F.R.S., exhibited a long series of Zyganas of the *transalpina* group together with a series of *Z. ephialtes* showing parallel variation, and Mr. Bethune-Baker in illustration exhibited with the epidiascope a number of slides showing the differences in the genital armature of the various species.—Mr. C. B. Williams demonstrated a method of collecting and storing insects, etc., fixed to leaves without pressure. A small, round, shallow pill-box, with or without a glass lid, is taken, and the inner cardboard ring separated from the rest of the box. For collecting, the lid of the box with this inner ring in it are placed over the specimen on the leaf and the rest of the box beneath. On pressing the two halves of the box together the leaf with the specimen on it is pressed to the bottom of the box, where it is protected and kept into position by the cardboard ring, which is pushed back into its original position.—Mr. Deuquet, who was present as a visitor, exhibited a number of Australian insects of various orders, many of which were still undescribed and unnamed.—G. C. WHEELER, Hon. Sec.

OBITUARY.

WILLIAM WEST (of Greenwich) passed peacefully to his rest on July 30th last at the residence of his son, 343, Green Lanes, Harringay, N. 4, in his eighty-fifth year. Born at Rotherhithe in 1836, he early removed to Greenwich, where he was apprenticed to John Penn & Son, then one of the, if not the leading engineering firm in the South of England, with whom he served for nearly fifty

years, the greater part of his time being spent in the brass foundry, where he attained to a position of some distinction, and from which he retired in 1899. Entomology seems to have had a fascination for him from his earliest youth, first as a collector of Lepidoptera, but later the Coleoptera, Hymenoptera and Orthoptera claimed the larger part of his attention, and of all these orders he amassed good representative collections, and only last year he presented his collection of Homoptera to the Natural History Museum. He was a good field naturalist, and in the days when Lee and Kidbrook were country places, these, with Greenwich Park, were among his, in the truest sense of the words, happy hunting-grounds. Of late, with more time at his disposal, it was his custom to spend a few weeks each year in such well-known localities as the New Forest, Wicken Fen, and so forth, and on these excursions he turned up many good and interesting species.

He was a man who wrote little, but in the earlier volumes of this magazine are a few notes from his pen, in one of which he records the capture of *Sphinx convolvuli* in Greenwich Park, and in another sets at rest the then moot point as to the identity of *Leptogramma scabrina* and *L. boscana*. He also wrote the articles on the Hemiptera-heteroptera and Hemiptera-homoptera for the 'Survey and Record of Woolwich and West Kent,' published in 1909, the appearance of the letters "W.W." as the authority for the record of the greater number of the species enumerated testifying to the assiduity of his work in these orders in the district under review. He was one of the founders of the South London Entomological Society, served on its first council, and was appointed its first Curator, an office that he held continuously until his death, thus covering a period of some forty-eight years. From small beginnings the collections under his care have grown to practically complete typical collections of all orders of insects, and it was he alone who knew how largely he had contributed to their completeness, for he appeared to have no greater pleasure than to fill in some gap that might add to their usefulness. A man of singularly equable and happy temperament, he will be missed by a large circle of friends, but perhaps by none so much as the members of the South London Society, where, meeting after meeting, with hardly a break, he was in attendance to assist the members in naming any doubtful specimens and to encourage them with his many reminiscences. Thus was he engaged even at the last meeting that he attended—little more than a week before his death. His end came as he could have wished. He had retired, as was his custom, to his own room to amuse himself with his books and collections, and on being called to the evening meal made no response. It was then found that he had passed peacefully away surrounded by the objects that in life he had loved so well. He was interred at Shooter's Hill Cemetery, Blackheath, with his wife, who had some years pre-deceased him. He leaves two sons and two daughters.

R. A.

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ARICIA MEDON, AB.

The above figure represents an unusual aberration of *Aricia medon* that I captured on Royston Heath on August 9th last. It was sitting on a blade of grass.—G. H. SIMPSON HAYWARD; Stow-on-the-Wold.

THE MACRO-LEPIDOPTERA OF COUNTY TYRONE.

BY THOMAS GREER.

THIS comparatively large county has been but imperfectly explored by the entomologist.

In March, 1882, the late Mr. Wm. F. de Vismes Kane, D.L., commenced the investigation of the local lepidoptera at the fine old demesne of Favour Royal and about the wild glen of Alta-diawan, on the slopes of Slieve Beagh mountain on the southern boundary of the county.

The results he obtained in this district were published in 1883,* and afterwards formed the basis for his 'Catalogue of the Lepidoptera of Ireland,' which first appeared in serial form in 'The Entomologist.' The more noteworthy of his captures here (many of which do not seem to occur elsewhere in the county) include the following: *Sarrothripa rerayana*, *Aeronycta megacephala*, *Xylophasia sublustris*, *X. hepatica*, *Oirrhodia ligula*, *Venusia cambrica*, *Perizoma tenuata*, *Eupithecia indigata*, *E. distinctaria* (*Thymus serpyllum* is unknown in the county), *E. lariciata*, *E. haworthiata*, *Lobophora halterata*, and *Eulype hastata*. My own observations are confined to the east of the county, within a nine miles radius of the town of Cookstown. I am also much indebted to Prof. J. W. Heslop Harrison, of Armstrong

* "Report on the Entomology of certain districts in Ulster," 'Proceedings of the Royal Irish Academy,' June, 1883.

College, Newcastle-on-Tyne, for much valuable information and a very complete list, with several additional records, the result of two holiday visits to this district in 1909 and 1910; the more interesting of these notes, with others, appeared in the 'The Entomologist,' vols. li and lii, under the title of "Gleanings from My Note-books."

A large area in the centre of the county, consisting of wide moorlands, studded with numerous lakes; fertile valleys, many glens clothed with native shrubby woods; dominated by the isolated mountain Mullaghcarn, 1778 feet in elevation; and in the north a mountain range rising to over 2000 feet; is all practically unknown as far as the lepidoptera are concerned. Perhaps *Erebia* var. *cassiope* may some day be discovered on these mountain slopes, if the supposition is correct, viz. that this species passed from Scotland across the north-west of the country to the Mayo mountains, its only known Irish habitat.

The few lepidoptera that have been met with in this remote district are not without interest; a fine form of *Dryas paphia* with greenish white spots on the wings was found in one of the glens where the type is abundant; *Catocala typhon* is often plentiful on the boggy ground, and *Polyommatus icarus* is large and fine.

Of the western area bordering on the County Donegal little or nothing is known; a fine banded form of *Oporinia dilutata* is common in Baronscourt demesne.

Turning to the east, the Lough Neagh district, with its miles of low peat-bogs (fast disappearing owing to drainage and peat-cutting), is the home of some local insects; on the bogs *Callophrys rubi* frequents the birch trees, as also *Drepana falcula* and *lactinaria*; among the heather and dwarf birches *Ptychopoda* (*Acidalia*) *inornata*, *Selidosema ericetaria* and *Perconia strigillaria* are often not uncommon, followed later by *Eueretagrotis* (*Agrotis*) *agathina*, and *Dyschorista suspecta*; *Dasychira fuscifascia* is also confined to this district. On the sandy shore of the lake *Euxoa* (*Agrotis*) *restigialis* occurs together with *Gortyna* (*Hydracia*) *crinansensis*, and in the marshy meadows *Leristria* (*Hydrelia*) *uncula* is locally abundant.

The geology of the county is very varied, the northern mountains and a considerable area thereabouts are composed of metamorphic rocks; in the centre Old Red Sandstone and Silurian; in the south Carboniferous Limestone and shales; and in the east coal measures, New Red Sandstone, Magnesian Limestone, volcanic rocks, with the Tertiary clays of Lough Neagh.

The following list includes all the records and localities quoted by Mr. Wm. F. de Vismes Kane (K.) in the 'Catalogue of the Lepidoptera of Ireland,' as also the notes and observations of Prof. J. W. Harrison (H.). Records uninitialled the writer is responsible for. Those marked thus * are unrecorded for the county in Mr. Kane's catalogue.

The arrangement and nomenclature are based on South's 'Butterflies and Moths of the British Isles.'

RHOPALOCERA.

Pierinæ.

Pieris brassicæ, L.—Fairly abundant, but the least common of the local species of *Pieris*; as a rule single-brooded, several females with spots on fore wings almost connected by a suffusion of dark scales.

Pieris rapæ, L.—Abundant generally in the cultivated districts, some of the males of the spring brood almost spotless, and many of the females of the summer emergence are yellowish, and often with spots in disc of lower wings, and upper wings suffused with dark scales up to discal spots.

Pieris napi, L.—Very abundant, the males of the spring brood varying from an immaculate form to one with well-marked discal spot; some of the females very faintly marked; others have the spots blurred into one another and the fore wings almost all suffused with grey scales, and the nerves of the hind wings strongly marked in grey. In the summer brood males with an additional spot on fore wings are frequent; many of the females have the spots and inner marginal dashes of a burnished appearance, and suffused forms are darker than in the spring brood. In both emergences pale primrose and yellow forms are not uncommon; one example of a dull ochre yellow with base of wings darker taken in the Lough Fea district, August, 1907. A dwarf form is common; smallest specimen, a female (yellow), measures 30 mm. (centre of thorax to apex \times 2).

Euchloë cardamines, L.—Almost as abundant as the preceding species; largest example, a male, 51 mm.; a small form is also frequent, smallest specimen taken, 29 mm. Earliest date April 20th, 1918. The following aberrations have occurred locally: *sulfureorenata*, Keynes; *citronea*, Wheeler; *ochrea*, Tutt; *caulosticta*, Williams; *radiata*, Wms., and *marginata*, mihi.

Nymphalidæ.

Aglais urticæ, L.—Generally abundant, banded forms approaching var. *polaris* sometimes not uncommon; one specimen with chalky-blue apex and hind wings without blue crescents, captured at Lough Neagh.

Vanessa io, L.—Abundant of late years in this district; specimens with a blue spot under the "eye" on the hind wings are common—ab. *cyanosticta*, Raynor.

Euvanessa antiopa, L.—One seen near Trillick by Rev. S. L. Brakey (K.). Some years ago I was shown an example in a collection taken at Rockdale, near Cookstown, in August, 1904.

Pyrameis cardui, L.—Not common, but specimens seen or captured in most seasons.

Pyrameis atalanta, L.—Not uncommon most years; abundant last year (1919).

**Argynnis aglaja*, L.—Observed on several occasions by Prof. J. W. H. Harrison dashing along the shore of Lough Fea; a fine female near Grange, August 28th, 1920.

Dryas paphia, L.—Locally abundant and widely spread throughout the county, as at Five-mile Town, Favour Royal (K.), Lissan, near Clare church (H.), shore of Lough Neagh, Lough Fea. The larva in this district feeds on *Rubus idaeus* a *Viola canina*.

**Melitea aurinia*, Rott.—Locally abundant, the prevailing form being *paeclarata*, Kane. A form of var. *scotica*, Robson, occurs on the magnesian limestone near the village of Grange; this is much darker than that figured in Mr. Kane's catalogue. Another local variety has the transverse band pale lemon colour and a black marginal band to hind wings: no pale-coloured crescents. The var. *virgata* is not uncommon, and var. *artemis*, Fb., rare: localities—near Stewartstown very abundant, Grange, near Dungannon, and on bogs at Tamnamore.

Pararge egerides, Stgr.—Abundant almost everywhere in woods and in lanes. Generally there are three emergences in the season—in April and May, July, end of August and September. The females of the spring brood often have the spots much extended; on the other hand, the males in the autumn often are very dark with only the pale spots round the apical ocelli present; one female of the autumn brood has an extra spot in each hind wing near the anal angle.

Pararge megaera, L.—Locally abundant and double brooded; examples with additional spots are not uncommon.

Epinephele jurtina, L.—Very common. In the males the fulvous colour is sometimes much extended; the females also often have a broad marginal band of the same colour on hind wings, and in both sexes the apical ocellus may be double. One example has a single ocellus on one fore wing and double on the other, the ocellus varying from a minute black spot to a circle a quarter of an inch in diameter. The var. *addenda* is not uncommon on heathy ground, the number of additional spots varying from two to eight, and one male of this form has two small ocelli on upper side of hind wings near the inner margin.

Aphantopus hyperanthus, L.—Locally common in damp meadows and on roadsides: males sometimes have no ocelli on upper sides, and females with more on one side than the other. Mr. Kane reports it as abundant at Favour Royal.

Crononympha typhon, Rott.—Generally abundant on the moorland near Lough Fea and also on the bogs at Lough Neagh. A poorly spotted form approaching var. *scotica*, Stand., is rare at

Lough Fea, whence I have a female with double apical ocelli. Recorded by Mr. Kane from the county, but no locality given.

Cœnonymphia pamphilus, L.—Abundant on heaths and in rough meadows; occurs on the same ground as *C. typhon*. A teratological, perhaps gynandromorphous, specimen, with wings on left side much larger than those on the right, was captured June, 1920. Many have the fringes yellowish, as noted by Mr. Kane of Sligo examples.

Lycenidæ.

**Callophrys rubi*, L.—Local in the Lough Neagh district, but much less common than formerly; also at Lurganboy, near Stewartstown; the larva feeding on *Erica tetralix*.

Chrysophanus phœas, L.—Generally common, very abundant in 1919. The var. *cœruleopunctata* is frequent, one example combining abs. *schmidtii* and *intermedia*; a straw-coloured form taken near Favour Royal (K.); several similar to the one figured in South's 'Butterflies of the British Isles,' pl. ci, fig. 8.

Polyommatus icarus, Rott.—Although this species is very local, and does not occur in large numbers, a few interesting aberrations have been met with in this district, among others the following: a gynandromorphous example—left side male, right side female—var. *cœrulea*, Coalisland, July, 1917; several teratological specimens with wings smaller on one side than the other; one with left hind wing scalloped; male of the colour as figured in 'Entomologist,' January, 1887, pl. ii, fig. 2; male with faint red marginal spots on upper side of hind wings, ab. *rufopunctatus*, Neub.; the variety with black spots on margins of hind wing, ab. *nigromaculata*, Ckll., almost as common as the type. Females varying from a bright blue form to a brown one with blue scales on basal areas; in many of the brown forms the red marginal lunules are much extended; several with discal spots on all wings, on upper side ringed with white or pale blue. The var. *icarinus*, Scriba, occurs occasionally. A curious female underside aberration has only one basal spot on left fore wing, the basal spots on hind wings very small, and the inner marginal series represented by minute white dots; captured near Lough Fea, July, 1918. Only single brooded here, from the end of June in early seasons to the beginning of September in late ones. Localities: Washing Bay and Killycolpy Wood on Lough Neagh, Coalisland, near Stewartstown, and Lough Fea.

Celastrina argiolus, L.—Rare; several examples captured some years ago among hollies growing on the edges of an oak wood (since felled) at Killymoon, near Cookstown; woods about Favour Royal, not very abundant (K.).

(To be continued.)

EREbia EPIPHRON, KNOCH: ITS SYNONYMY AND FORMS.

By H. ROWLAND-BROWN, M.A., F.E.S.

(Continued from p. 199.)

Herrich-Schaeffer, further ('Syst. Bearb. Schmett. Europ.', Bd. i, Regensburg, 1843), strikes out a new line altogether in his diagnosis of *Epiphron* under Genus ix, *Erebia*.

Figs. 92, 93 and 94 on Plate xx are devoted to the male and the female, and here for the first time not only is the male adequately represented, but we find that the three black spots on the antemarginal band of the underside of the hind wings are actually white-pupilled, though the spots of the fore wings are blind. The female is shown with the same distinctive marks on all the wings, upper and underside alike. Unfortunately the male is figured only for the underside, but in the introductory note of the Group B, *Aleæ, Annulis, Rubris, Cirea, Ocellos* (p. 65), he says:

"The eye spots in the female sometimes partially pupilled on both sides," and in the detailed description which follows, "small white pupils on the underside at least," while he explains the models from which the figures are drawn—"I have chosen for the underside of the male an example with large spots; the female is the only one (?form) which I have seen. . . . All the examples of true *Epiphron* which I have seen were from the Harz. . . ."

I cannot help thinking, in view of subsequent observations and the testimony of later authorities, that the male figured with the white pupils was an exceptional aberration. Otherwise it is difficult to account for so marked a character having escaped all writers and observers both before and after Herrich-Schaeffer's publication. It will be noted, also, that he does not mention the Vosges as a locality for *Epiphron* (or indeed, for *Cassiope*, which he confines to the Austrian, Swiss and South of France Alps), nor is he very copious in the matter of synonymy. Stephens he does not cite; but to *Epiphron* he adds, "*Cassiope* var. ? Boisd." Commenting, also, upon the form of *Cassiope*, "nach Wood auch in Schottland," he remarks that Wood's description applies only to that species, and not to *Epiphron*. The reference, I take it, is to William Wood's 'Index Entomologus,' published in London in 1839, consisting of 1944 figures of the Lepidoptera of Great Britain. But Wood makes no mention of *Cassiope* as a Scotch species. "Mts. of Cumberland, June," is all we find here, and Herrich-Schaeffer's mistake suggests that he thought Cumberland to be a Scotch county.

The year 1844 is further memorable in the history of the

species by the publication of Edward Newman's description of the first authentic Scotch examples received from Richard Weaver. His identification of them with *Erebia melampus*, Boisd. ('Zoologist,' 1847, pp. 1730-31) was, of course, an error, and this is corrected on the high authority of Henry Doubleday in the 'Catalogue of British Lepidoptera,' published in December, 1846, by Messrs. J. R. Hawley and A. J. Guns, to which I shall refer when I deal with the circumstances of the discovery, and the records of *Cassiope* in the United Kingdom. The Weaver specimens, sent for confirmation to Boisduval, came back, as might be expected, with the opinion that they were "distinct from the *Erebia melampus* of the Continent," though the doctor does not appear to have enlightened his correspondent to the extent of identifying them with *Cassiope*, Fabr.

Seven years later the whole question of separate specific identity is examined scientifically by Meyer-Dür ('Verz. der Schmett. der Schweiz., Abtheil 1, Tagfalter, Burdorf-Zurich, 1851, pp. 151-154). When writing this work he tells us that he received from Standfuss two *Epiphron* males from the Harz, and three males of a similar *Erebia* from the Altvater in Silesian Moravia. Comparing them with the Swiss *Cassiope*, he says, "*Epiphron* belongs undoubtedly to the species under review, and is placed, therefore, under the forms of *Cassiope* in the following arrangement :

- "*Cassiope* var. (a) *Bernensis*, on the highest Bernese Alps, 7500-9000 m.
- (b) *Valesiaca* (Freyer, Taf. 20, F. 1, 2), from Mayenwand, and the Alps of the Wallis, 5800-6500 m.
- (c) *Epiphron*, Harz, from 1800-3000 m.
- (d) *Silesiana*, Altvater at 4600 m."

and these conclusions at least establish my proposition that there is no specific, or even superficial constant, difference between the males of *Cassiope* and *Epiphron*, though Meyer-Dür, having come to this decision, should have used Knob's name in preference to that of Fabricius, which would have been the case most probably had the white-pupilled females been included in the series. It will be observed, however, that all the German examples examined by him were males, and that the ocellations were evidently without white pupils, or he would certainly have said so.

His var. *Valesiaca*, which he associates at a guess with Haworth's *Mnemon* ("die ich aus Autopsie nicht kenne"), he considers also as practically identical with *Epiphron*. It is described by Canon Favre* as "larger than the type (*Cassiope*), with numerous black spots on the rusty band, which is confluent

* 'Macro-lépidoptères der Valais.' Schaffhausen, 1899.

and uninterrupted and very distinct from the ground-colour. Localities : The Mayenwand and the southern slopes of the high Valaisian Alps, from 1700–2000 m. : at the Pierrevoir-sur-Bagnes and on the Simplon."

The var. *Bernensis* he places very near to var. *Nelamus*, Boisduval, and this being so there is no particular reason to retain the name, which, after all, is misleading as an index to the distribution of this form.

With regard to Meyer-Dür's var. *Epiphron* he concluded—“The chief localities are on the Oberharz, and between Heinrichshöhe, the Rehberge and the Rammelsberge near Goslar, in the Bodetal, and at Oderterche.”

Reverting to our chronological review, the next authority of any weight is Julius Lederer, who maintains *Cassiope*, Fabr., as the type ('Verhandlungen des zool.-bot. Vereins in Wien,' Jahrg. 1852, p. 23), as hereunder :

Cassiope, Fabr., H.-Sch., 535, 538.

v. *Nelamus*, B.

v. *Epiphron*, Knoch, H.-Sch., 92–94, Freyer, 554.

Eyea, Bkh., Freyer, 567.

Evidently he also was unaware that Knoch had fixed the type form prior to Fabricius, but at all events he abandons the theory of their being separate species. “*Epiphron*,” he says, “I consider to be only a variety of *Cassiope*: the angle of the hind wings is more or less decided in very pronounced examples of the latter also, and the larger eyes and livelier red in so variable a species as *Cassiope* are not sufficient to establish it as a separate species.”

Lederer is the first, moreover, to describe the var. *Pyrenaica*, HS. ('Pap. Europ.' tab. exi, figs. 535–538, *Cassiope-Pyrenaica*), for the author, though he published the figures—and very beautiful and true they are—apparently did not append an account of the Pyrenean form.

Of this variety Lederer says :

“Upper side with somewhat larger eyes: we have a closely corresponding form in the Styrian mountains.” “*Nelamus*, B., from Mont Dore in Auvergne, has on the upper side very little, on the hind wings sometimes no red: on the underside the eyes are feebly marked or very nearly extinct.”

However, in their treatise on the geographical distribution of the German and Swiss Lepidoptera (Leipzig, 1858), Dr. Adolf and Herr August Speyer adopt the correct method, treating *Epiphron* as the specific name for all the varieties and forms found in the Harz, Altvater, Vosges, Central Alps, the Banat of Hungary, and Britain, while drawing attention to the remarkable failure of the species in the Jura and the Black Forest (Th. 1,

pp. 195-196). A further note on the subject, included on p. 454 (*op. cit.*), is as follows :

" Since it has been proved by the establishment of a complete transitional series that the *Epiphron* of the Harz and the local varieties of the Alps are one and the same species, it follows that the previously acknowledged name *Epiphron*, Knoch, should be restored and should be made to apply at the same time to the highest developed form observed.

" *Cassiope* from the Altvater mountains should be classified as midway between the Harz and the Alps form, and in the Alps also the intermediate form, which has been described, and the development traced by Meyer-Dür is not wanting."

(To be continued.)

ENTOMOLOGY IN THE HOLY LAND.

BY CAPT. P. J. BARRAUD, F.Z.S., F.E.S.

(Continued from p. 173.)

LEPIDOPTERA, RHOPALOCERA.

The butterfly season commences in January with the earliest examples of *Doritis appolinus* and *Euchloë belemia*, gen. vern. Specimens of these were seen on Mount Carmel on the 4th of that month. Both species have a wide distribution in Palestine, chiefly along the mountain ranges, and extend to the highest summits (about 3000 ft.).

D. appolinus was seen in many localities, from Nazareth nearly as far south as Beersheba, and was on the wing until well into April.

E. belemia has a second emergence (gen. cest. *glauce*), commencing about April, and is seen everywhere.

Another universal species is *Colias edusa*, occurring all the year round, except during the worst part of the wet season.

Butterfly hunting on Mount Carmel in early spring is a never-to-be-forgotten experience. Quantities of large bright red *Anemone coronaria*, yellow and white *Narcissi*, and dwarf *Iris* of several colours fill every cranny amongst the tumbled masses of limestone. In the distance the deep blue of the Mediterranean Sea completes a picture of wonderful beauty.

In the late summer and autumn of last year, when the malaria season was at its height, I was unable, owing to pressure of work, to give any time to insects other than mosquitoes. This was unfortunate, as my district then extended from Egypt to Cilicia, and from the Mediterranean to the Euphrates. Now, owing to political changes, it is much reduced.

I find that one of the first butterflies mentioned in my notes

is *Danais chrysippus*. This was fairly plentiful amongst the sand-hills at the mouth of the river Kishon, near Haifa, in September and October. I do not remember having seen it elsewhere, but it is no doubt present in similar localities along the coast.

Pyrameis cardui is of course universally common. On January 6th I found some larvae about to pupate in nettle leaves spun together, at Beisan (Beth Shan). These pupated four days later, and the perfect insects emerged on February 26th and 28th.

Of the genus *Pieris* I have only, so far, taken *P. rapæ* and *P. brassicæ*, both fairly commonly; also *Gonepteryx cleopatra* and a beautiful *Thais, cerysii deyrollei*, Obthr. (*tricaudata*).

The last named was first seen on the hills south of Hebron on March 25th at about 2300 ft. Subsequently a few were caught on the hills which stand round about Jerusalem (2500 ft.) and at Solomon's Pools, south of Bethlehem.

In the neighbourhood of Jericho, at about 1000 ft. below sea-level, *Euchloë charlonia*, gen. vern., *levaillantii*, Roths, *E. ausonia egyptiacæ*, Verity, and *E. belemia glauca* were taken during the first week in April, together with a few worn specimens of *Chrysophanus phœbeus*.

The more recent material has not yet been worked out, and will be dealt with in a subsequent article.

HETEROCERA.

At the beginning of this year I made a small moth-trap, but, owing chiefly to a rather enclosed situation, it has not been very successful.

In January a short series of *Dasycorsa* (*Dasycephala*, Stgr.) *modesta*, Stgr., were captured. These show a fair amount of variation, from an almost unicolourous light chestnut brown to a much darker shade, the deeper coloured specimens having specklings of very dark scales. Haifa, January 10th to 25th; Nazareth, February 20th: and El Afule, January 21st.

Seven specimens of another of the Geometridæ, *Zamaera flabellaria*, Heeger, came to light at Haifa between the 11th and 29th January. This moth has a very curious resting attitude; all the wings, which are rather narrow and pointed, fold longitudinally, closing like a fan. The hind wings lie along the abdomen, and the fore wings stand upwards, diverging from one another. The general coloration is grey, and the appearance suggests a piece of split bark.

One specimen of the very delicate buff and yellow Thorn moth *Eumera regina*, Stgr., was taken at light at Haifa on November 19th.

Other species caught at Haifa in that month were: *Cidaria alticariata*, Ramb. (= *ibericata*, Stgr.)?; *Gymnoscelis pumilata*, Hb.; *Eupithecia centaureata*, Schiff. (= *oblongata*, Thnb.); *Cidaria*

obstipata, Fb. (= *fluriata*, Hb.); *Ptychopoda fractilineata*, Zell., and *Acidalia ochroleucata*, H.-S.

On November 2nd at Ludd I found *Rhodometra sueraria*, Linn., and *Eupithecia centaureata*, Schiff.

Of the Noctuidæ only a few have yet been identified, and I am obliged to Mr. George Talbot for notes upon them.

Cucullia chamomilleæ, Schiff. One specimen hovering round flowers in a tent at 6 p.m., January 2nd, and one at light the same evening. "This is probably a form of ab. *calendulæ*, Tr., which may prove to be a local race."

The following were taken at light in January at Haifa :

Plusia gamma, L. "An unusually grey form, nearer in tone to the American *P. californica* than to typical *gamma*. This may be a race."

Amathes (= *Orthosia*, O. of Stgr.'s Catalogue) *kindermannii*, F. var. *paulli*, Stgr.

Eumichtis (= *Hadena*, Schrk. of Stgr.'s Catalogue) *solieri*, Boisd. "An extra rich dark form; have only seen the white stigma in this and another Syrian specimen—? racial."

Of the smaller moths I have been fortunate in finding two new species—*Alucita parca*; Meyr., sp. nov., one at Haifa, 29 : vi : '19, at rest on a tent roof; and *Platyedra cruenta*, Meyr., sp. nov., Haifa, 6 : xii : '19, at light.

(To be continued.)

CONTRIBUTIONS TO OUR KNOWLEDGE OF THE BRITISH BRACONIDÆ.

By G. T. LYLE, F.E.S.

(Continued from p. 186.)

Microdus rufipes, Nees.*

Easily recognised by the extensive sculpture on the abdomen, segments 1, 2, and part of 3 being distinctly striolated; legs, including the coxae, testaceous, only the hind and middle tarsi and tips of hind tibiae being dark; terebra as long as the body without the head.

Harwood has a male taken in a Colchester garden July 24th, 1914, and in the Dale Collection is a pair from Devon. In June, 1916, I reared a pair from New Forest larvæ of *Tortrix variegana*. Two males and two females from Darenth Wood are in Fitch's Collection, and also the male bred by Elisha from *Coleophora gryphipennella*, July 31st, 1882. †

* 'Mon.', vol. i, p. 146.

† 'Trans. Entom. Soc.', 1885, p. 275.

The cocoon is white papyraeous, and so thin that the metamorphoses of the insect within are plainly visible; in my examples the cocoons were constructed within leaves rolled by the hosts.

Microdus mediator, Nees.*

Up to the present included in our British list on the strength of a single female taken by Fitch at Maldon, August 11th, 1870, and described by Marshall.† This specimen is still in good condition. The species is very close to *lugubrator*, Ratry.; indeed, little but size seems to separate the two. Nees gives the length of *mediator* as $4\frac{1}{2}$ mm., which is far larger than any of our British examples, none of which exceed 3 mm.—a figure agreeing more closely with Ratryeburg's species. Five specimens taken by Dale (one marked "G. W.", the others without data) and erroneously named by him *cingulipes* are certainly of the same species as the insect in the Fitch Collection. I reared a female from an unknown host, July 22nd, 1908, and beat a second from Douglas Fir, in the New Forest, August 31st, 1912.

All these examples have the first segment of the abdomen somewhat coarsely striolate, second stippled, coriaceous, and third exhibiting faint indications of the same. Antennæ 28-jointed (excepting in two cases, where the number is 29), terebra slightly shorter than abdomen, valves subelavate; second cubital cell subquadrate, irregular, wings infumated (considerable variation is shown in the tint of the wings, but the age of the specimens may have something to do with this), nervures and stigma fuscosus. The male, hitherto unknown, appears scarcely to differ from the female, excepting, of course, in the lack of terebra and the usual rather narrower abdomen.

Microdus rugulosus, Nees.‡

The only British record is that of Curtis ('Guide,' 2nd ed., col. 116). Four specimens so named in the Dale Collection must all be referred to the genus *Earinus* (see *E. transversus*).

GENUS 4, *Earinus*, Wesm.

Wesmael invented this genus to receive those species, previously included in *Microdus*, having the first cubital cell divided from the first discoidal by a distinct nervure. The character, rightly considered by Marshall to be of no more than sectional or specific value, is in itself unreliable, for while I have seen

* 'Mon.' vol. i, p. 146.

† 'Trans. Entom. Soc.,' 1885, p. 276.

; 'Ich. de Foest.,' vol. iii, p. 45.

‡ 'Mon.' vol. i, p. 148.

§ 'Nouv. Mem. Ac. Brux.,' 1837, p. 8.

species of *Microdus* with the dividing nervure well marked, others, quite undoubtedly belonging to the genus *Earinus*, have the nervure but faintly indicated or even widely interrupted. It seems to me that the genera may be more certainly separated by the presence or absence of deep mesothoracic sutures. In *Microdus* these sutures are distinctly and deeply marked, while in *Earinus* they are entirely absent or only very feebly indicated. This character was brought to notice by Reinhard. I find also that in *Earinus* the metathorax is much smoother than in *Microdus*.

TABLE OF SPECIES.

- (10) 1. Tubercles of first abdominal segment not prominent.
- (9) 2. Third segment of abdomen smooth or at most feebly and partially striolate, and without a *distinct* curved transverse impression.
- (4) 3. Mesothorax and scutellum rufous *nitidulus* var.,
thoracicus, Nees.
- (3) 4. Mesothorax and scutellum black.
- (8) 5. Hind coxae rufous; terebra as long as abdomen or thereabouts.
- (7) 6. Length 7-8½ mm.; hind tibiæ white at base. *nitidulus*, Nees.
- (6) 7. Length 4-4½ mm.; hind tibiæ ochreous at base *ochropes*, Curtis.
- (5) 8. Hind coxae black, terebra as long as body *delusor*, Wesm.
- (2) 9. Third abdominal segment striolate and with a very noticeable curved transverse impression *transversus*, sp. nov.
- (I) 10. Tubercles of first abdominal segment prominent *tuberculatus*, Wesm.

Earinus nitidulus, Nees.*

A large shining species with hyaline wings, the third abscissa of the radius sinuated and the terebra equal in length to the abdomen. Thomson considered this to be the same as *gloriatorius* Paney†; the synonym, however, presents difficulties. All the examples I have seen agree with the original description excepting that the obtuse medial carina on the first abdominal segment is in distinct or wanting, though there is an elongate central depression, on either side of which is a carina, in some cases bifid as mentioned by Nees; these characters are variable and difficult to seize. Marshall's description in the 'Transactions of the Entomological Society' seems to imply that all the tarsi are black, but in all the specimens I have examined only the hind pair are dark. For many years the name was retained in our

* 'Mon.', vol. i, p. 144.

† 'Faun. Ins. Germ.', vol. ix, p. 102, t. 17.

British list on the strength of Curtis's record in his 'Guide' (2nd ed., col. 116), and it was not until May 10th, 1897, that a second British example was obtained, being taken by Bignell, at Bickleigh, Devon. In the Cambridge University Museum is a male labelled "British, before 1868, ex col. P. J. Sellby," and a female from the old Philosophical Society Collection. Dale's Collection at Oxford yields three females, one without data, the others "G. W., April 9th, 1894," and "Bournemouth, 13/4/1868" respectively. The usual length would seem to be 7 mm., with a wing expanse of 15 mm., though two of the Oxford females are $8\frac{1}{2}$ mm. in length and expand $16\frac{1}{2}$ mm. These fine examples show distinct traces of a short rudimentary nervure emitted from the middle of the outer side of the second cubital cell, as in the continental genus *Diosphrys*, Foester. Although thought by Wesmael to be distinct, *Microdus thoracicus*, Nees, which has the mesothorax and scutellum red, is now considered to be merely a female variety. Two Oxford and the one Cambridge example are of this form, which to me appears to have the terebra slightly longer and first abdominal segment somewhat smoother than in typical examples.

The variety at first sight greatly resembles *Microdus calculator*, though a glance at the hind tibiae, which in *calculator* are deep black, will be sufficient to separate the two.

(To be continued.)

ON THE ABUNDANCE OF THE LARVÆ OF PYRAMEIS ATALANTA.

By PAYMASTER-IN-CHIEF GERVASE F. MATHEW, R.N., F.L.S., F.E.S.

THE most noteworthy entomological feature of the present season in this neighbourhood is the extreme abundance of the larvæ of this beautiful butterfly. Almost every patch of nettles exhibits the spun-together leaves which form the tents of the larger ones. But although the larvæ are so plentiful the hibernated perfect insects were rarely seen. I noticed the first on June 14th, one June 18th, and two June 19th. On July 17th I saw a very fresh-looking example, which had probably just emerged, as some of my larvæ at that time had already become pupæ; and on July 29th saw several fresh imagines and one very much worn, and the same day found full-grown, half-grown, and larvæ only a few days old.

But of course these hibernated butterflies must have been on the wing before the date on which I first noticed them, for I was finding full-grown larvæ on July 8th, and the eggs from which they were produced must have been deposited at the end of May or early in June.

I have taken these larvæ over a large area, but they seem to prefer the neighbourhood of houses and farm-yards, and so may almost be looked upon as a domestic species. I have even found them in the centre of the town wherever a few nettles happened to be growing near a wall or upon a rubbish-heap.

Farming about here is not carried on in a very scientific manner, and there are many meadows and rough fields where nettles have been allowed to spring up in large patches, together with numerous spear and other thistles. Larvæ are to be found in all these patches, but are more plentiful in those growing near fences. They also prefer the young plants to those that are old and tall, and liable to be blown about by the wind. They are seldom seen in the beds of dusty nettles growing by the roadside.

In a large field, within five minutes' walk of my house, nettles were very numerous in the early spring, but were cut down about the middle of May. They have now grown up again, and the young and tender shoots are $1\frac{1}{2}$ ft. to 2 ft. high. At the beginning of July they were teeming with larvæ of all sizes, and on the 24th of the month in about an hour I found sixty-five full-grown larvæ and one pupa in this field, and might have taken many more. On the same day I noticed many quite small larvæ and others from a quarter- to half-grown.

The eggs are laid singly and the females take a considerable time in depositing all their ova. They have to be continually moving from place to place to find suitable plants. So many ova are laid one day, then perhaps two or three dull days may intervene, and if this happens often she may take a month or perhaps longer before she has finished laying. This accounts for pupæ and very small larvæ being found the same day.

In the 'Entomologists' Record,' xix, pp. 105-8 for 1907 I made some remarks on the hibernating habits of this species, and among other things wrote: "Some entomologists seem to think that in certain seasons this butterfly is double-brooded, but I fancy this is a mistake caused by the fact that it is a long-lived species and females deposit their ova from June until August, so that the offspring of the same parent may be living as larvæ, pupæ, or even imagines at the same times." I should have said that they commence to lay their ova according to the state of the weather—from the middle of April, in early seasons, to towards the end of July.

The young larvæ live in a little house which is formed of a single leaf, carefully turned down and fastened along its edge, and with a small opening at the point through which the larva thrusts its head and eats portions of its own home or the adjoining leaves. When very young they content themselves with nibbling little blotches into the cuticle. The full-grown larvæ construct large tents or caves, composed of several leaves

fastened down over each other. These are conspicuous objects, particularly in the young nettle beds. If the nettles happen to be in flower they will occasionally compose the cave entirely of its drooping flower or seed tassels, and then they are not quite so easy to see. Sometimes the shoot is bitten halfway through, about 1 in. or 5 in. from its tip, which causes it to droop over the lower part of the stalk, where it is formed into a cave with the aid of the adjoining leaves, which are fastened securely to the main stem. When full fed the larvæ spin a pad of silk on the roof of their cave and from it suspend themselves to change to pupæ. In confinement, where the larvæ were a good bit crowded, they often ate each other out of house and home, and then crawled on to the muslin covering of their breeding-cage, upon which they spun pads of silk and suspended themselves therefrom. A few endeavoured to surround themselves with a screen of open network, but the greater number hung perfectly free.

The bottles for containing the food, standing on the floor of the breeding-cages, were packed round with fine shavings so as to keep them steady and in position. Several larvæ managed to force themselves into the shavings and construct very comfortable-looking caves, wherein they became pupæ. Other larvæ were kept under large glass cylinders, with muslin pasted over the top. This was a capital style of breeding-cage, as the movements of the larva could be so easily watched.

On several occasions I saw the full-grown larvæ exposed on a leaf, but they were not feeding—merely resting, I fancy, before constructing a fresh tent, for they often eat themselves out of their original dwellings, and then have to construct new ones.

These larvæ do not vary very much. The typical form is grey-green, with yellowish spines. But there is one handsome variety—nearly jet-black, with a conspicuous spiracular stripe formed of large yellow blotches, and all the upper surface is thickly irrorated with little yellow dots. It is a fat, stumpy larva, and to the touch feels like a piece of india-rubber.

The larvæ of *atalanta* do not seem to suffer as much from the attacks of ichneumous, etc., as those of *Io* or *urticæ*. In some of the turned-over leaves I found the shrivelled remains of small larvæ, together with a number of little white or amber-coloured cocoons of some species of ichneumon. A few of the larger ones, when suspended for change, instead of turning to pupæ became black and flaccid and much distended with fluid, and this I think was due to some form of disease caused by the wet weather.

Some of the pupæ, a short time after assuming that state, became much discoloured, and are apparently dead, but so far have not disclosed any parasites.

Up to the present time I have taken six pupæ and 355 larvæ of *atalanta*, and have bred 21 imagines, the first one emerging on July 31st.

The larvae of *V. io* have not been as common as usual, and I have only seen eight broods. I took a few from each—about a hundred altogether—and 60 per cent. of them were ichneumoned.

Larvae of *A. nrticae* have been quite rare, and I only came across three small nests, taking a dozen from each, and they were all stung.

Dovercourt, Essex ;
August 10th, 1920.

NOTES AND OBSERVATIONS.

ABERRANT BUTTERFLIES.—The following aberrations, taken by my brother and myself during this year, may be of interest: *Melanargia galatea*, male, taken July 18th, 1920, at Broadway, Gloucestershire. The black markings on the under side of the hind wings and the tip of the fore wings are replaced by a golden brown. The specimen is perfectly fresh. *Pararge megera*, female, taken August 6th, 1920, near Penzance. The whole space between the central transverse lines on the fore wings is black with the exception of a few fulvous scales at the end of the discal cell. The same area on the under side is shaded with black. The specimen is unfortunately badly damaged. *Epinephele jurtina* (*ianira*), female, taken August 15th, 1920, near Penzance. The whole of the brown colour and the black eye-spot are replaced by silver-grey on the upper side, while the under side approaches this colour. The fulvous portions retain their normal colour on both sides. *E. jurtina*, female, taken August 8th, 1920, near Penzance. The usual fulvous patch on the wings is entirely replaced by white, while the brown portions retain their usual colour. The under side is slightly pale. (A number of specimens approaching this form were taken.) *E. tithonus*, male, taken August 12th, 1920, near Penzance. A very dark specimen in which the black encroaches upon the fulvous on all the wings, reducing that on the hind wings to a few scales only. On the under side of the fore wings the basal area is covered with black scales.—E. BOLTON KING ; Arden Lodge, Warwick.

NOTE ON THE BLUE-SPOTTED FORM OF CHRYSOPHANUS PHLEAS.
—During the summer of this year I have examined 537 specimens of *Chrysophanus phleas*, and though no striking aberration resulted, I was interested to note that, while out of 145 specimens taken on a small piece of marshy ground, so large a number as 117 showed at least traces of a row of blue spots inside the coppery bar on the hind wings, only 54 out of the remaining 392 which were taken on the drier meadows showed any traces of blue. I noticed that the blue-spotted specimens were greatly in evidence about the water meadows on the south-eastern side of Thetford, Norfolk, while they were not to be found on the heathy ground on the south side; and bearing in mind these observations made in June, 1917, I decided to test my conclusion that in all probability the blue-spotted specimens were of a marshland variety this year, with the above results. I should be interested to know if any other readers of the 'Entomologist' have

made similar notes.—STANLEY N. A. JACOBS; High House Farm, South Common, Chailey, Sussex.

COLIAS EDUSA IN DEVONSHIRE.—I saw a male *C. edusa* near Brixham on August 3rd, and, as was to be expected after the spring immigration, *Pyrameis cardui* is now plentiful in this district.—E. D. MORGAN; 27, Sanford Crescent, Chelston, Torquay.

This species has been plentiful in this locality during the last two months.—R. H. MOORE; Heathfield, Plymstock, September 14th, 1920.

COLIAS EDUSA IN HAMPSHIRE.—On August 30th I captured, at an upper branch of Duck Hole Bog in the New Forest a very bright and fresh male *C. edusa*. On August 31st I saw a specimen on the shore at the mouth of Christchurch Harbour.—W. J. LUCAS.

COLIAS EDUSA AB. *HELICE* IN GLOUCESTERSHIRE.—On August 31st I took a specimen of the *helice* form of *C. edusa* in the garden here. Unfortunately one of the hind wings was damaged, otherwise it is good. With the exception of a female of *C. edusa*, taken on August 27th of the present year, I had not seen the species here since 1892.—G. H. SIMPSON HAYWARD; Leominster Place, Stow-on-the-Wold.

COLIAS EDUSA IN WEST SUSSEX.—On August 13th, a hot, sunny day, *Colias edusa* was abundant in the clover-fields and lanes near Bosham and in good condition. *P. atlanta*, *P. cardui*, *V. io*, *P. megera*, *E. ianira*, *E. tithonus*, *P. icarus* and "skippers" were also out in great numbers in the same locality. I never remember seeing so many butterflies in one, comparatively, small space before; they simply swarmed and were a beautiful sight. Of course the clover was in full bloom and the hedgerows a mass of flowers so there was everything to attract them. (Miss) A. D. EDWARDS; Iron Latch Cottage, Selsey, Sussex; September 10th, 1920.

COLIAS EDUSA IN SOMERSET. I saw one *C. edusa* while out shooting to-day.—WALDEGRAVE; Chewton Priory, Chewton Mendip, Somerset, September 9th, 1920.

COLIAS EDUSA IN 1920. The following occurrences of *Colias edusa* have come to my knowledge: Sussex: One at Rogate in August. Hampshire: One seen on Petersfield Golf Course in the first week of August. Dorset: Three in the neighbourhood of Corfe Castle in the second week of August, one at Lyme Regis in September. Somerset: One seen on the railway-bank a short distance west of Templecombe Station in the first week of September. Devon: Three at Seaton in the second week of September. Wales, Glamorganshire: Three reported from Cowbridge in September.—HAROLD HODGE; 9, Highbury Place, N. 5, September 18th, 1920.

GONEPTERYX RHAMNI IN THE CITY.—Coming out of the Tube at Chancery Lane Station mid-day to-day I was surprised to see a male specimen of *G. rhamni*. It was flying slowly along in the direction of Kingsway, being buffeted by the traffic.—J. G. STAVYNS; September 7th, 1920.

PYRAEIS ATALANTA IN EAST LONDON.—On August 20th I observed a fine fresh *Pyrameis atlanta* flying down Coventry Street

Whitechapel—a somewhat unusual neighbourhood for this bright insect—and on August 24th I saw another specimen of the species in Marquess Road, Hackney. Being confined to town for business reasons this year it was refreshing to see these insects apparently enjoying a spell of sunshine as much as though they were in their natural surroundings.—ERNEST CRABBE; 52, Sarsfeld Road, Balham Park Road, S.W. 12.

PYRAMEIS ATALANTA IN THE NEW FOREST.—*P. atalanta* is very common in the Forest and apparently in beautiful condition. *Vanessa io* also occurs, but I have only seen it very occasionally.—W. J. LUCAS; Brockenhurst, September 3rd, 1920.

LIMENITIS SIBYLLA IN SURREY.—An error has crept into my note on this subject, published in the current number of 'The Entomologist.' My capture at Byfleet was made on July 16th, and not on August 16th, as incorrectly printed on p. 210.—F. W. CAMPION; 58, Ranelagh Road, Ealing, W. 5, September 7th, 1920.

POLYGONIA C-ALBUM IN WANSTEAD PARK.—During a walk to-day in a rather unfrequented part of the above park I saw a very fresh specimen of this species at rest on a leaf with expanded wings. I know this butterfly is not uncommon in some parts of the West, Midland and Welsh counties (I used to take it near the River Wye more than forty years ago), but this is the first specimen I have seen near London.—W. PASKELL; 85, Second Avenue, Manor Park, E. 12, September 10th, 1920.

TACHINID FLY ATTACKING LARVA OF SPILOSOMA LUBRICIPEDA.—On August 25th I noticed a larva of this moth pursued by a fly, which alighted upon it several times, and each time the caterpillar appeared to try and shake it off, and ran very fast as if to escape from its enemy, finally disappearing into a crevice. I could not capture the fly, but suppose it was *Tachina ciesia* (see 'Entomologist,' vol. xi, p. 78). Another larger Tachinid, with the sides of the abdomen yellow brown, is common in the garden in June and July.—W. PASKELL; 85, Second Avenue, Manor Park, E. 12, September 10th, 1920.

MANDUCA ATROPOS AND DEILEPHILA LIVORNICA IN CORNWALL.—On September 12th, 1920, a fine specimen of *M. atropos* ♂ was found in a house in the Falmouth district. *D. livornica* was found by a little girl at Maenporth, near Falmouth, during May of this year sitting on a hedge.—LEONARD B. HOPPER; Penryn, Cornwall.

BRYOPHILA MURALIS.—On July 13th I captured in North Cornwall a ♂ and ♀ *B. muralis* within a few inches of one another, which I assume had paired. The ♂ was worn and had evidently been out some time. A few days later in South Devon I again noted another specimen spoilt by a spider. On September 5th I again took a fine ♀ in Sussex. These divergent dates of capture are, I think, of sufficient interest to warrant recording.—JNO. PEED; Whittlesey.

ACRONYCTA ALNI IN STAFFS., 1917.—I took a larva of *A. alni* in 1917 upon gooseberry. Two days later I obtained another upon

beech. This species, in common with many others, was universally plentiful in the Lichfield district. Two other records of the larva will be found in the report for the year of the North Staffs. Field Club.—A. SORWIRTH : Chasetown, near Walsall, Staffs.

LEUCANIA VITELLINA IN DEVONSHIRE.—On September 7th I took at sugar in my garden a fine specimen of *L. vitellina*.—R. H. MOORE ; Heathfield, Plymstock.

HELIOTHIS PELTIGERA, ETC., IN SOUTH HAMPSHIRE.—During August last, while searching restharrow at night in this district, I had the good fortune to find larvae of *H. peltigera* not uncommonly, in company with the usual *Pyrrhia umbra*, *Aspilates ochrearia*, etc. Those that I collected duly pupated, and I hope to breed the moths shortly.—A. T. POSTANS ; 148, Fawcett Road, Portsmouth.

CATOCALA NUPTA, AB.—On August 31st I had brought to me a very remarkable var. of *C. nupta*. The fore wings are entirely black, with the exception of a thin, grey marginal line. Head and body jet black; hind wings normal, except that the red is a somewhat deeper shade than is usual. I do not know if this variety has previously been recorded, but it is new to me. The moth, a male, is one of a batch bred this season.—F. HOWARD LANCUM ; "Fernside," Shepherd's Lane, Dartford.

THAMNONOMA BRUNNEATA IN HERTFORDSHIRE.—I have to record the capture of *Thamnonoma brunneata* at light in the college grounds at Bishop's Stortford on June 25th, 1920. There is no *Vaccinium* in the district. I took imagines of *D. irregularis* and *A. rubiginata* on August 4th this year at Tuddenham.—C. MELLOWS ; The Yews, Peterborough.

A ROUGH FIELD IN THANET, AUGUST 20TH.—Possibly a list of species, especially Tortries, taken this August in a rough, flowery field near Broadstairs may be of interest to local collectors. Wild carrot, ragwort, mugwort, milfoil, clover, teasel, etc., were the most conspicuous of the wild flowers, with a very little *Centaurea scabiosa*. The following species were common: *E. dubitana*, *E. atricapitana*, *E. erigerana*, *D. acuminatana*, *D. simpliciana*, *C. francillana*, *C. nigromaculana*, *C. smethmanniana*, *C. perlulus*, *A. gilaria*, *E. oblongata*. A few specimens occurred of *L. rufulana*, *E. roseana*, *L. compositella*, *H. sinuella*, *N. noctuella*, *A. promutata*, *O. clathrata*, *C. geniculens*, and one specimen each of *L. palealis*, *P. zephyrana*, *H. binevella* and *H. ochroleuca*. The last-named was, however, found freely on the *Centaurea* in the neighbourhood, together with *C. alternans*. Outside this particular field the most interesting of my captures were *A. rusticana*, a *T. cretacea* in Broadstairs itself, one specimen only of each, some fine yellow aberrations of *B. perla*, and, on the sandhills at Sandwich a good series of *O. distans*.—H. C. HAYWARD ; Repton.

PILADES CRENANA.—As it seems to be questioned whether this species is double-brooded, it may be as well to put on record that on September 11th and 13th I bred two from larvae obtained in Rothiemurchus Forest, Inverness-shire, in July last. *Myrmecocella ochra-*

ceella was common in the ants' nests.—FRANCIS C. WOODBRIDGE: Briar Close, Gerrard's Cross.

ÆSCHNA CYANEA IN WORCESTERSHIRE.—A friendly neighbour brought me in a fine male of this dragonfly to-day (July 14th). He had caught it resting on his raspberry-canapes. Lucas ('British Dragonflies,' p. 202), does not quote many Midland records for this species, and states that it "seems to have a decidedly southern range." It is, however, fairly common in this northerly corner of Worcestershire. I have often watched it hawking here to-and-fro over the ponds in a dell locally known as the Golden Valley.—J. W. WILLIAMS, M.R.C.S., etc.: Bewdley.

RESEMBLANCE TO SURROUNDINGS IN MOTHS.—It is an interesting question which Mr. Lucas has raised with regard to moths resembling their surroundings. I think we may take it for granted that moths fully realise the importance of protecting themselves during the hours of daylight. You have only to look into a moth trap shortly before dawn to see all the moths struggling against the glass, trying to find a way out, whereas an hour before they were dancing round the lamps, or resting contentedly in the most exposed positions. As night gives place to morning the moths seem to realise that even if they escape it is too late to be of any advantage to them, and making the best of a bad job, take up the best positions in the trap they can find, *D. scabriuscula*, for instance, always choosing a place which has been painted black. Where are the vast numbers of moths in the daytime? Comparatively few are seen in exposed positions, such as tree-trunks or fences, except after a night of strong wind. They creep into crevices and wood stacks, out of reach of the most painstaking bird. But what about the few moths that are in exposed positions? I believe that these, either because they were *in cop.* or for some other reason, have been caught out too late, and sooner than risk being on the move in the daylight take up a position whereon they find themselves. I give them credit, unreasonable as it may seem, of exhibiting a good deal of ingenuity on these occasions. I came across *D. fulcataria* once on a tree-trunk: if it had rested in a horizontal position I don't think it would have deceived me, but instead of this it selected to imitate a dead birch-leaf. Its wings were perpendicular, up and down the tree-trunk, the pointed ends representing the stalk and point of the leaf. After looking at it for a second or two and thinking there was possibly a cocoon behind the leaf, I put out my hand to pull it from the trunk by the stalk, when the leaf changed into a moth and flew away.—FREDERICK GILLETT; Cheriton House, Sevenoaks, July 31st, 1920.

FORMATION OF A SOUTHAMPTON ENTOMOLOGICAL SOCIETY.—A meeting of a number of gentlemen interested in entomology was held in Southampton on July 25th for the purpose of forming an entomological society in that district, and it was decided unanimously that such a society should be formed, to be called the Southampton and District Entomological Society. A discussion as to the various activities that might be entered on brought forth some useful suggestions. It was finally arranged to make an immediate start on

the formation of collections of insects and of a library of entomological books and photographs; to hold meetings on the first and third Tuesdays of each month; to hold, in addition, rambles in order to thoroughly investigate the insect fauna of the district. As regards the collections, the Lepidoptera will be in the charge of Mr. W. Fassridge, M.A., Mr. E. Hayward will supervise the collection of Coleoptera, and Mr. F. J. Killington will take charge of the Odonata, etc. As the Society grows it is hoped that others will come forward to assist. Until such time as the membership is greater it was decided to do without the usual officers, with the exception of a secretary and treasurer, and Mr. F. J. Killington, of 68, Archer's Road, Eastleigh, was elected to fill the dual office. The modest sum of 5s. was fixed as the present annual subscription. It is hoped that all keen entomologists in the district will seek membership.

SPHECOMYIA INANIS, FLU.—With reference to Mr. Morley's note on this Anthomyiid fly, *antea*, p. 213, may I draw attention to my record ('Ent. Mo. Mag.', 1905, p. 163) of two males taken July 2nd and 6th, 1903, at Aberfoyle, Perthshire? The species is also recorded by Mr. Charbonnier from two localities in Somerset ('Proc. Soc. Arch. and N. H. Soc.', vol. Ixiv [1918]), and is included by Haliday in his list of Holywood Diptera. As regards its association with wasps, Prof. Newstead ('Ent. Mo. Mag.', 1891, p. 41) found the larva in swarms in a nest of *V. germanica* on October 1st, 1889, at Ince, Cheshire, from which imagines hatched in the following July. Probably females occurred amongst these, but our other records (where the sex is noted) refer to males only.—A. E. J. CARTER; Monifieth, Forfarshire.

ESCHNA MINTA, LATR., AT BRIGHTON.—I had the good fortune to capture, in an extremely easy manner, a fine male specimen of this uncommon dragonfly at Brighton. I was walking through the Steine Gardens on the afternoon of August 27th and espied it resting in the sunlight on the leaf of a shrub: it allowed me quietly to approach and take it in my fingers. I do not know who was the more surprised, myself or the dragonfly, for this particular insect has earned a name for great wariness. —F. J. KILLINGTON; 68, Archer's Road, Eastleigh.

NOTE ON *ERISTALIS TENAX*. At the beginning of this month I was exploring the almost dark interior of one of the disused stone quarries at Dancing Ledge, on the rocky coast of South Dorset, when I was surprised to hear a loud buzz of insects—a noise like that heard when standing near a bee-covered clump of lavender or Michaelmas daisies, and intensified by the stone walls, roof and floor. On my eyes becoming more accustomed to the dim light I was able to discern the cause of the noise—a number of common drone-flies, as far as I could see all *Eristalis tenax*, flying about a few inches from the ceiling, now and then hovering beneath a particular spot, settling, and then moving off to a fresh one. The roof was some 12 ft. from the floor, and there was no means of examining the movements of the flies more closely, but they appeared to be sucking up something from the stone. The quarries, used for obtaining Purbeck stone, are cut into the side of the sea cliff, and are nearly always damp inside.

Eristalis tenax is, under ordinary circumstances, a nectar feeder, so is there some sweet substance which exudes from the roof, soaked through from the stone above, to attract these sun-loving flies into such a dismal place? Perhaps a reader of the 'Entomologist' can explain the phenomenon.—W. J. ARKELL; Redlands Court, Highworth, Wilts, September 16th, 1920.

SOCIETIES.

LONDON NATURAL HISTORY SOCIETY.—May 4th.—Mr. R. W. Robbins, President, in the Chair.—Messrs. H. J. Davies and H. S. Stowell were elected Members of the Society.—Dr. Cockayne read a paper on "Fluorescence in Lepidoptera," which was followed by an interesting discussion.

June 1st.—The President in the Chair.—Rev. H. J. Gamble was elected a Member of the Society.—Among the entomological exhibits were: *Aricia medon* and its varieties *salmacis* and *artaxerxes* from Scotland (Mr. H. B. Williams); *Euchloe cardamines*, a series (Mr. C. H. Williams); galls of *Andricus circulans* on *Quercus cerris* from near Hounslow; *Neuroterus tricolor* on *Quercus pedunculata* from which the flies were emerging.—H. J. BURKILL, *Minuting Sec.*

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—June 24th, 1920—Mr. K. G. Blair, B.Sc., F.E.S., President, in the Chair.—Exhibition and discussion of *Hydriomena furcata*, Thun. (*clutata*).—Messrs. Turner, Barnett, etc., exhibited series. The first-named showed a copy of Thunberg's 'Dissertationes,' 1784, containing the original figure and description of the species, and read notes on the lines of variation and pointed out the named forms. In Mr. Barnett's series was a very fine example of the *infuscata* form.—Mr. S. Ashby, specimens of the rare beetle *Lema erichsoni* taken by Mr. Ashby and himself near Rye in April last.—Mr. Bennett, series of the Rhyncophorous beetle *Attelabus nitens* (*circulionoides*) with leaves of oak rolled by the larvae, and also larvae and pupae of *Ledra aurita* (Hemip.).

July 8th, 1920.—The President in the Chair.—Mr. Newman exhibited living larvae of *Phryxus livornica* from ova laid by a female captured in Dorset in May, and made remarks on their habits.—Mr. Withycombe, a larva on hawthorn of *Saturnia pyri* from a batch of ova from S. France.—Mr. Dunster, a series of *Melitta aurinia* taken in Somerset in May, and of *Epinephele tithonus* showing additional spots on the fore wings.—Mr. Carr, series of *Brenthis euphrosyne* from Crockham Hill.—Mr. K. G. Blair, bred specimens of the bee *Colletes daviesana* from Shanklin, with five species of inquilines and parasites; also living examples of *Cicindela germanica* bred from larvae found May 4th.

July 22nd.—Mr. K. G. Blair, B.Sc., F.E.S., President, in the Chair.—The President exhibited *Cimex pipistrellus*, a Hemipteron infesting the bat.—Mr. Turner, a box of Lepidoptera collected by Mr. Grosvenor, chiefly at Bangalore, India.—Mr. Priske recorded that in five or six traps set in Richmond Park for Coleoptera, five

species of *Necrophorus* were caught, a different species in each trap; the sixth trap contained two species of *Silpha*.—Mr. Newman reported non-success in getting the larvae of *Phrynos hornica* to pupate, abundance of *Argynnis aglaja*, fair numbers of *Plebeius aegon*, the apparent disappearance of *Melanargia galathea* from West Kent, and that nearly everything in captivity was making a second brood.

August 12th. The President in the Chair.—The death of Mr. W. West, of Greenwich, on July 30th was announced. He was one of the original members of the Society in 1872, and the Honorary Curator from the beginning. Mr. H. Main exhibited from the South of France larvae of *Ascaphus* sp., *Euranessa antiope*, *Papilio alexander*, *P. podalirius* and *Myrmecion* sp., with ova of *Parnassius apollo* and *Mantis religiosa*, with parasites of the latter. Mr. Priske, the cockroach *Ectobius perspicillaris* with its egg-cases, and the larva of *Microdon* sp. (Dip.), from an ant's nest. Mr. B. S. Williams, *Pyramis atlanta*, having the lowest subapical bletch absent.—Mr. Step, living specimens of *Doreas parallelopipedus* (Col.), from Wimbledon Park. Mr. Sieb, pupal cases of *Aphelosetia (Elachista) cerusella*, and the larval mines in a leaf of *Phragmites communis*, gathered at Byfleet during the Society's Field Meeting in July; and also the three British species of the genus *Oehsenheimeria*.—Mr. Bunnet, *Selicia tetralunaria* from Farnborough, Kent.—*Hy. J. TURNER, Hon. Editor of Proceedings.*

BRADFIELD COLLEGE SCIENTIFIC SOCIETY.—The following observations made by members of the above Society may be of interest to readers of the 'Entomologist.' *Euranessa antiope*.—A lady tells me that while out for a walk on July 20th, she observed two large dark butterflies with white borders to the wings, which settled on the path before her. She pointed them out to her sister who was with her, and both ladies gave the same description, and were quite certain as to its accuracy. This is of course a doubtful record, but it would be interesting to know whether any other specimens of *E. antiope* have been seen in Berkshire this year. *Apatura iris*.—A female was seen ovipositing on sallow. The insect was not captured, but the ovum was obtained. A male was also seen flying over the oaks. This is the first seen at Bradfield for some years. *Pararge egeria* var. *egerides*.—One was taken here on July 24th. This is the first Bradfield example that I have heard of. **Annual Exhibition.**—The annual exhibition of the year's work was held on Sunday, July 18th. Among others we noticed the following: One *Hamearis lucina*, as against four in 1919. Long series of *Chattendenia w-album*, several ab. *bifloweri*, Kroul, and ab. *obsoleta*, Tutt. I have never seen *w-album* so abundant as it was this year. *Hemaris tityus* more numerous than *fuciformis*, only one specimen of the latter being exhibited. A pale straw-coloured xanthic example of *Pararge megara* which has probably been named long since, but for which I have used the ins. name *bradanfeldia*, n. ab., and a pale pink specimen of *Hippocrita jacobeae* (ab. *roseae*), the green colour being olive grey tinged with green. *Melanargia galathea* appeared in some numbers this year, which is most unusual, only single specimens having been noticed in 1918 and 1919.—*JON S. E. W. BLACKIE, Hon. Sec.*

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DESCRIPTIONS OF TWO MOTHS FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

Spilosoma solitaria.

♂. Antennæ bipectinated, black; head and thorax black, the latter with an orange yellow dot in front and jet black lines above; abdomen orange yellow with seven black rings, the seventh twice as wide as the others. Wings blackish, black markings as in the female. Underside fuliginous.

Expanse 36 mm.

The male specimen now described was received for identification from Dr. Shiraki, of Taihoku, Formosa, labelled as follows:

"Formosa, Koshun, 1918, iv, 25-v, 25, J. Sonan, K. Miyake, M. Yoshino."

Although differing greatly in size and colour from the female, it agrees exactly in markings of thorax and very closely with those on the wings and abdomen. Unfortunately the wings are considerably abraded. The female was described as *Diucrisia solitaria* in 1910 ('Entom.', vol. xlvi, p. 245).

Gandaritis postalba, sp. n.

♂. Head and thorax yellowish mixed with purplish brown, abdomen greyish brown. Fore wings yellow, mottled with pale purplish brown, basal area purplish brown; antemedial line angled below costa and indented before dorsum, discal mark blackish; postmedial dark purplish, rather wavy, outwardly oblique to vein 4, thence inwardly oblique to dorsum, subterminal line purplish brown, wavy, most distinct towards costa; a dark purplish line from apex of the wing unites with the postmedial by a bar along vein 5; the enclosed space is clearer yellow than rest of the wing; terminal area below the line from apex purplish, except at tornus; fringes dark purplish brown. Hindwings white, terminal area yellow, inwardly bordered with purplish; fringes dark purplish. Underside similar to above, but fore wings without purplish brown mottling.

Expanse 62 mm.

The male specimen described, which is not in very good condition, was received for identification from Dr. Shiraki, of Taihoku, Formosa, labelled as follows:

"Horisha. 18 . v . viii, H. Kawamura."

EREBLA EPIPHRON, KNOCH: ITS SYNONYMY AND FORMS.

By H. ROWLAND-BROWN, M.A., F.E.S.

(Continued from p. 225.)

Probably H. von Heinemann (and H. F. Wocke) had already completed the first volume of 'Die Schmetterlinge Deutschlands unter der Schweiz,' published at Brunswick in 1859, when the brothers Speyer's book was issued. At all events *Cassiope* (36) and *Epiphron* (37) still rank as species, though the distinguishing characters are no longer defined as the eye-spots, but extend to the shape of the fore wings noted by Lederer, which are described as rounded at the apex in the case of the former and sharply angled in the case of the latter. His opinion of their specific identity, however, is not omitted.

The tradition of the double species, indeed, was destined to die hard, and was perpetuated by many other authors both at home and abroad during the "fifties" and "sixties" and even in the "nineties." In England, Henry Doubleday makes *Cassiope*, Fab., the type of the genus "*Erebia*, Boisd., *Orcina*,* West.," with *Mnemon*, Haw., and *Melampus*, Newm., var., as synonyms (cp. 'Synonymic List of British Lepidoptera,' 1850). In 1852 or 1853 Dr. J. C. Kayser ('Deutschlands Schmetterlinge,' Leipzig), without figuring them, separates *Epiphron*, Knoch, from *Cassiope*, and repeats without discrimination of sex the "oft gekernten Augen." But as he announces August the month for the perfect insect in each case, it may be suggested that he, too, derived his knowledge of this *Erebia* in a state of Nature secondhand. A few years later, again, Ménétrier's ('Lepidoptera Diurna,' St. Petersburg, 1855), anticipating von Heinemann, puts the cart before the horse with "687 *Cassiope*, 688 *Epiphron*." H. T. Stainton also ('Manual of British Butterflies,' vol. i, pp. 29-31) gives *Cassiope* specific rank without the author's name appended. But Stainton does not recognise apparently even the most pronounced variations from the type as to be treated separately, much less awarded varietal names.

Werneburg, too, maintains the type form and the variety as separate species in 1864 ('Beitrage zur Schmetterlingskunde,' p. 21). But Berce ('Faune Entomologique Française, Papillons Lépidoptères,' vol. i, pp. 86-87, Paris, 1867) appreciates their true relationship and writes :

"Cette espèce habite les montagnes du nord de l'Allemagne, et si nous la mentionnons ici, c'est que nous avons pris sur les hauts sommets des Vosges avec la var. *Cassiope* des individus qui ne diffèrent en rien de ceux que nous possédons du nord de l'Allemagne."

* "Some . . . have been separated generically under the name of *Orcina*, Westw., but I can find no character which justifies their separation from *Erebia*, and even if there were the name is pre-occupied" (Elwes, 'Trans. Ent. Soc. London,' 1895, p. 181).

Of *Cassiope* he says :

" Les individus des Vosges sont plus noirs, la bande ferrugineuse plus vive, et les points noirs mieux marqués que ceux des Alps, et de l'Auvergne."

A little later Edward Newman (London, 1874; his work on the British Butterflies bears no date), recognises *Epiphron* as the type, and adds that "in accordance with the usage of science the earliest name only is retained." But the next German writer, Gustave Ramann, ignoring all previous authorities, including the famous 1871 Catalog of Staudinger, drops *Cassiope* altogether ('Die Schmetterlinge Deutschlands und der angrenzenden Lander,' Arnstadt, 1872-1875). A figure of *Epiphron* is shown on the somewhat rough chromolithographic quarto plate xi, fig. 254, but fig. 255, referred to in the legend as *Melampus*, is decidedly more like it.

Next, following Newman, comes the Rev. F. O. Morris's more ambitious but far less practical 'British Butterflies and Moths' (1876), which includes a number of coloured illustrations rather above the average in quality for the time. It cannot, however, be regarded as a serious contribution to the then knowledge of our insular insect fauna, being in most cases obviously little more than a compilation from preceding authors. But I mention it because, although the writer speaks in the text (p. 53) of "the small black dots with obscure pupils" on the wings of *Hipparchia cassiope* (no allusion is made to *Epiphron*), the accompanying plate shows an underside of the male and an upperside of the female in both of which figures the eye-spots are pupilled with white. I think the artist probably took Knoch's original female figure for his model, and got over the difficulty of figuring the male with the supposititious white-pupilled ocellations by inventing an underside which might square with the ambiguous wording of Knoch's description.

Although the published works on the western palaeartic Lepidoptera, other than special monographs and catalogues, for the next five and twenty years are neither many nor remarkable, the correct style of nomenclature for our species becomes established, or nearly so. In 1884, after several years' publication in separate parts, Dr. H. C. Lang's 'Rhopalocera Europæ' appeared in book form, and is still the only complete work on the western palaeartic butterflies in the language with coloured illustrations. Here *Erebia epiphron*, Kutz. (sic), is properly recognised as the type, and vars. (a) *Cassiope*, Fab., etc., (b) *Nelamus*, Boisd., and (c) *Pyrenaica*—no author cited—follow.

In 1889, however, "with the object of making the butterflies of the palaeartic fauna better known to English entomologists," having already reviewed the genera *Colias*, and *Parnassius*, Mr. H. J. Elwes, F.R.S., published his "Notes on the Genus *Erebia*" ('Trans. Ent. Soc. London,' 1889, pp. 317-342), and in

the accompanying synopsis, omitting the greater part of the synonyms and references given by Staudinger, we find our subject treated as follows :

1. *E. epiphron*, Knoch. . . . *Hartz, Siles., Blk. Forest, Vosges.*
Var. *pyrenaica*, H.-S. (inconstans, nomen vix conservandum, transitus ad *cassiopem* in partem). *Pyr. or.*
Var. *cassiope*, Fab., etc. (inconstans, formae intermediae adsunt). . . . *Alps, Pyr., Hung. mont, Scot.*
Ab. *nelamus*, Boisd. (ab. vix fasciata et fere ocellata).
? Var. *kefersteini*, Ev. (forma dubia mihi natura ignota). *Sib. cent. mont.*

and nine years later, in the same author's 'Revision of the Genus *Erebia*', this arrangement is repeated with the proper omission of *Kefersteini* ('Trans. Ent. Soc. London,' 1898, p. 174).

It will be observed that Mr. Elwes is disinclined even to separate *Cassiope* from the type, for he continues (*loc. cit.*, 1889, p. 332)—" *E. epiphron*: After examining a very large number of specimens, I can only say that, though the form *Cassiope*, which represents the species in the Alps," meaning thereby, I conjecture, the Central Alps, "is very different in typical examples from *Epiphron* of the Hartz mountains and Silesia, yet it is so variable that in the Pyrenees especially and also in Scotland it cannot be looked upon as constant. The varieties *Vogesiaca** and *Pyrenaica* connect it with *Epiphron*, and the form *Nelamus* is an extreme variety or aberration in which the ocelli have almost or entirely disappeared. In the Balkans and Carpathians, from whence, however, I have seen but few specimens, the type is rather of *Epiphron* than *Cassiope*.

The volume of Barrett's 'Lepidoptera of the British Islands,' which contains the butterflies, bears date 1893. *Erebia epiphron* from Scotland is figured side by side with *Cassiope* on Plate xxix, figs. 1, 1a and 1b, but it is clear from the text (p. 210) that Barratt was not acquainted with Knoch's *typical* female in nature :

" In the form originally described under the name of *Epiphron*," he writes, " the black dots are enlarged, and commonly contain white centres or pupils. . . . I am not familiar with this form, but Dr. Buchanan White states that specimens from Perthshire possess this character in the female. This certainly is not universal even in that district, since in a long series . . . I find no trace of the white centres to the black spots in either sex."

In 1895 Mr. Edward Meyrick, F.R.S., in his 'Handbook of

* Mr. Elwes appears to have invented this name for the specimens in the British Museum Collection from the Vosges. They were at one time distinguished by a label bearing the legend *Vogesiaca*, Christ, but this name of Christ's having been bestowed on the Vosges form of *Manto*, it was afterwards removed at my suggestion to its proper place under that species.

the British Lepidoptera,' enumerates on p. 340 "*Erebia epiphron* (*Cassiope*, F.)," thus. It is all the more surprising, therefore, to find Fritz Rühl in the same year reverting to the discarded classification of the German writers in his work, "Die palæarktischen Gross-schmetterlinge" (Bd. i, Tagfalter, pp. 474-475). But he gives his reasons for so doing, inconclusive though they may appear, as being based almost entirely on superficial characters, which, as we have seen over and over again, vary indefinitely in the intermediate forms between the type and *Cassiope*, and this is his arrangement of the type and its varieties:

Epiphron, Knoch.

Var. *Pyrenaica*, H.-S., *Melia*, Kaden.

Cassiope, F.

Var. *Nelamus*, Boisd.

Var. *Valesiaca*, Meyer-Dür.

and to justify these conclusions he adds: "Schmetterling ebenso gross wie *Epiphron*, zu welcher Art *Cassiope* häufig als Varietät gestellt wird, jedoch habe ich nach Verleichung des mir volligenden umfassenden Materials die Ueberzeugung gewonnen, dass *Cassiope* als eigene Art zu betrachten."

In the following year, 1896, J. W. Tutt, under the title of *Melampias epiphron*, Knoch, accepts and incorporates ('British Butterflies,' pp. 425-430) the classification, and the several varieties adopted by Mr. Meyrick and Edward Newman, and finally by Dr. Fras. J. Buckell in his paper on "*Erebia epiphron* and its Named Varieties—A Study in Synchrony," published July 15th, 1894, in the 'Entomologist's Record,' v, pp. 161-165, adding on his own account:

N. ab. *obsoleta*, "with the fulvous bands entirely absent, the upper surface unicolorous blackish-brown."

Simultaneously the late Mr. W. F. Kirby, in 'A Hand-Book of the Order Lepidoptera,' pt. 1, i, p. 23), as if there were still a doubt as to the specific identity, makes the curious remark under *Erebia epiphron*, var. *E. cassiope* (sic), "In the allied form *E. epiphron*, Knoch, which many writers consider to be the same species, but is very doubtfully British, the eyes are ocellated."

The figure of *Epiphron* (plate viii, fig. 1) in Prof. Ernst Hofmann's 'Die Gross-schmetterlinge Europas,' 1894, is a daub. It is intended apparently to represent a female of the type, and displays an insect with large white ocellations to the spots in a continuous series of rusty bands on the fore and hind wings alike. The text is as uninstructive. But both description and figures are much improved in Dr. Arnold Spuler's third edition of the same work, published at Stuttgart in 1903, where the classification is varied as follows:

"ab. *nelamus*, constituting the transition to the ab. *mnemon*.
ab. *pyrenaica*."

In 1906 the Editor of the 'Entomologist,' Mr. Richard South, continues the arrangement already recognised by his contemporaries in 'The Butterflies of the British Isles,' treating *Cassiope* as a variety, and concluding that all the British examples of the "small mountain ringlet" examined by him are referable to the form known as *Cassiope*.

But if, at the close of the nineteenth century, there existed any reasonable doubt of the identity of the two butterflies, it should have been dispelled by the structural researches instituted by Dr. T. A. Chapman ('Transactions of the Entomological Society of London,' 1898, pp. 209-239). In "A Review of the Genus *Erebia*, based on an Examination of the Male Appendages," read before the Society on February 16th, 1898, he says, *passim* (p. 213) :

"These 'Grass Erebias' are those that puzzle one in the field and even in the cabinet perhaps, more than any others. It is therefore very satisfactory to find that the forms of the clasp are quite distinct in the nine species, and especially that they are most markedly so in precisely those species that are most frequently confused, or likely to be so. Thus . . . *E. epiphron* and *E. christi* might be confounded, but the clasp is very different." And, a little further on (p. 218), examining in detail the genital armature of the first mentioned, he continues—" *E. epiphron* (plate viii, fig. 7) : The clasp of the species with which *Cassiope*, *Nelamus*, and the other named forms agree, has a slight fulness preceding the neck. The neck and head are rather less than a third of the total length of the clasp, the styles being numerous, very small, and of tolerably uniform size. In *Nelamus* the clasp is slightly shorter and the basal styles more frequently somewhat longer."*

It is, of course, uncontested that, in the words of M. Oberthür ('Lépid. Comparée,' fasc. vii, p. 208), "deux espèces différentes par d'autres caractères peuvent avoir une même armature génitale," but enough has been written already to identify *Epiphron* and *Cassiope* specifically on other grounds, their habits and bionomics in all their stages, though I believe no one has yet reported having bred the two forms from the same batch of ova or larvae, as years ago Buckler settled the identity of *Aricia medon* and its vars. *Artarverxes* and *Salmacis*.

With the weight of Dr. Chapman's authority behind him, and with the record of excellent work done by other British and continental lepidopterists, it is melancholy to find in Dr. Adalbert Seitz's 'Die Gross-schmetterlinge der Erde,' Stuttgart, 1909, that Herr von G. Eislinger has made a regular hash of so many of the Erebias. Apparently he is ignorant of, or has not taken the trouble to refer to, the several papers in the 'Transactions'

* Plate vii, fig. 7.—*E. epiphron* : c, clasp (Chamonix) ; d, clasp (Germany). Var. *Cassiope* (Sau Alpe) : a, tegumen; b, clasp somewhat flattened. Var. *Nelamus* (Cimenter, Engadine) : e, tegumen; f, clasp; g, clasp.

of the Entomological Society of London and the magazines which I have cited, and where, to give a single instance, convincing proofs are furnished of the specific difference of *Erebia mela* and *Erebia lefebvrei*. He is, however, better advised in the matter of *Epiphron*, retaining as varieties *Cassiope*, *Nelamus*, *Valesiaca* and *Mnemon* (which he assigns oddly to Hewitson), with ab. *Obsoleta*, Tutt. Nor is there much in his diagnosis of typical *Epiphron* to which objection can be taken, save in so far that he seems to infer that the type *only* occurs in the Hartz. But once again the artist has played the author false. On plate xxxvi(a) the typical female does not show the famous white pupils, while the eighth figure in the row, named *Nelamus*, is, in fact, the very *Obsoleta* which he describes as the form devoid of bands and spots alike on the upper side of the wings.

To sum up, then, the synonymic history of the species, it is well to have noted that, almost without exception from the days of Knoch onwards, those writers who have made *Cassiope* a variety of *Epiphron*, or given it rank as a species, base their conclusions upon the absence of the white-pupilled ocellations in the female, and that seldom, if ever, is this character definitely attributed to the male of the type form. Possibly white-pupilled males are occasionally taken with the similarly marked females; but these are so rare that, in default of any better evidence to the contrary than is furnished by Knoch's original description, we are justified in the conclusion that practically no characteristic distinction by means of the eye-spots only is to be found as between the majority of male *Epiphron* and the so-called male *Cassiope*. *Epiphron* to the modern collector is that form of the male in which the eye-spots are most amply developed irrespective of white markings; male *Cassiope* includes all forms of the male between the type and the "almost eyeless" *Nelamus*. Where the line is to be drawn between the type and *Cassiope* proper it is impossible to determine. Perhaps it will be most convenient to retain as *Epiphron* only those in which the rusty bands, plus a full complement of ocellations thereon, are developed on all the wings on the upper side; as *Cassiope* the forms in which the band is more or less broken up, and the ocellations—never white-pupilled—are less in number. And by this arrangement we shall arrive at a reasonable basis for classification of the principal and distinctive named forms as follows, practically identical as far as it goes with Mr. H. J. Elwes's arrangement of the *Epiphron* group, and endorsing also the opinion of Dr. Fraser Buckell ('Entomologist's Record,' loc. cit., p. 165) that, "so far as recognised named varieties are concerned" (other, in my own view, than var. [et ab. ?] *Pyrenaica*—for *Pyrenaica* is reported by Lederer from Styria), "they should be regarded, if retained, rather as sub-varieties of *Cassiope*."

Erebia epiphron, Knoch, ante-marginal bands complete.

var. (et ab. ?) *pyrenaica*, H.-S.

- var. *cassiope*, Fab. (? ♀ only), ante-marginal bands broken up or obsolescent.
 ab. *nelamus*, Bsdv., with reduced ocellations, but bands more or less present.
 ab. *obsoleta*, Tutt, with neither bands nor ocellations.

to which later may perhaps have to be added some of the forms recently described from isolated regions—the Carpathians, Balkans, etc.—which I hope to examine in detail later.

CONTRIBUTIONS TO OUR KNOWLEDGE OF THE BRITISH BRACONIDÆ.

By G. T. LYLE, F.E.S.

(Continued from p. 230.)

Earinus ochropes, Curtis.

Black; legs rufo-testaceous, tibiae paler, hind coxae sometimes darker at base, hind tibiae ochreous with the apex fuscous and faint indications of a dark ring before the base; hind tarsi, and occasionally middle tarsi also, dark. Antennæ dark, apex of second joint and base of third rufo-testaceous, 34–35-jointed. Orbita immaculate; squamulae dull rufo-testaceous; wings hyaline, slightly clouded towards apex, nervures fuscous, sometimes paler, stigma fuscous. First cubital cell separated from first discoidal by a not very distinct nervure; second cubital cell triangular, third abscissa of the radius almost straight, second abscissa nearly obsolete. Mesothorax smooth with the sutures barely indicated; metathorax almost smooth, with two central, longitudinal, parallel carinae, between which is a narrow, more or less punctate space. Abdomen with the first segment margined, longitudinally striolate, and two carinae reaching the middle; second segment feebly irregularly striolate, with indications of a transverse curved impression and foveæ at the basal angles; third smooth, though in the females faint traces of striolation and a transverse impression may often be detected. Terebra slightly longer than the abdomen. Length 4½ mm., expands 10 mm.

Probably Curtis's description of this species was never published, and so far as I can learn at the moment his MS. is with his collections in Australia. The Rev. J. Waterston, of the British Museum, has most kindly looked-up Dale's copy of Curtis's 'Guide to an Arrangement of British Insects,' which is now in the possession of the Museum, and finds no MS. notes opposite *ochropes*, though it appears as a *nomen nudum*. In the first edition of the 'Guide' *ochropes* is cited as follows:

105.

Bassus, B.E. 73.

Microdus, Nees.

13 \times *ochropes*, Curt.

The number 105 refers to the column of the 'Guide,' 3 is the number of *ochropes* in the species listed, † signifies that Curtis and Dale were the first to discover the species in Britain, and Mr. Waterston thinks that × probably indicates that the specimens are in Dale's Collection. I have been much interested to find nine ancient examples in this collection without data, but all under the name of *ochropes*, Curt. In all probability these specimens were named by Curtis and came from Dorset, as in his 'History of Glanvilles Wootton' C. W. Dale records the species as common; the collection also contains a female from Shetland (1890), and a male labelled "G. W., 1898." The only example I have taken myself, a female, was swept from low bushes in a lane at Hunstanton, Norfolk, May 31st, 1918. In Fitch's Collection is a female ticketed "*delusor*?"

This species differs from *tuberculatus*, Wesm., in having the radius straight, second cubital areolet subtriangular and not quadrate, and tubercles of first abdominal segment not prominent, from *gloriatorius*, Panz, in the much smaller size and colour of hind tibiæ, and from *delusor*, Wesm., in the colour of hind coxæ etc., and length of terebra.

Earinus delusor, Wesm.*

Considered by Marshall to be the same as *Bassus gloriatorius*, Panz, † though that species has a length of 7 mm. while *delusor* attains only 5 mm. Later writers have again separated the two so that we can no longer retain *gloriatorius* in the British list. *Delusor* has the hind coxæ black, hind tibæ whitish, with the apex and a ring before the base black, and terebra somewhat shorter than the body (as long as the body without the head, according to Marshall).

Four males in Marshall's Collection in the British Museum are the only examples I have seen and these I have not examined carefully. Mr. Waterston tells me that a female (not a Marshall specimen) which accompanies them is wrongly placed, being apparently a *Microdus*.

Earinus transversus, sp. nov.

Black, shining; mouth piceous, mandibles usually lighter, palpi pale; antennæ dark, with extreme apex of second joint and base of third rufous; orbits immaculate; legs testaceous, hind coxæ and femora rufous; hind tibiæ whitish, apically black, and with a faint trace of a dark band before the base; hind tarsi black. Wings hyaline, first cubital cell very distinctly separated from the first discoidal, second cubital cell subquadrate, usually externally incomplete; squamulae testaceous, stigma and nervures fuscous. Antennæ 37-jointed in both sexes. Mesothorax smooth, feebly

* 'Nouv. Mem. Acad. Sc. Belg.', vol. x, p. 12.

† 'Faun. Ins. Germ.', vol. ix, p. 102, t. 17.

punctulate, with very faint traces of the sutures; metathorax punctulate, pubescent, with two central, parallel, longitudinal carinae, between which is a narrow depression; mesopleuræ smooth and shining. Segment 1 of the abdomen laterally longitudinally striolate with two carinae which disappear before the middle, the space between smooth (in the males the carinae are somewhat indistinct). Segment 2 irregularly striolate with a curved transverse impression. Segment 3 *with a similar curved transverse impression*, striolate at base but apically smooth; other segments smooth and shining. Terebra rather more than half as long as abdomen. Length $5\frac{1}{2}$ mm., expands $10\frac{1}{2}$ mm.

(To be continued.)

ON SOME VARIATIONS OF *APHANTOPUS HYPERANTHUS*.

BY THE REV. H. D. FORD, M.A.

A. hyperanthus is common in many parts of this district, and in two or three restricted localities those variations of the underside, known as *arete* and *cœca*, are, comparatively speaking, not rare. During the past four years my son and I have given considerable attention to these forms; altogether we have captured and examined between 120 and 140 specimens, and as we estimate that these variations are in the proportion of about 4 or 5 per cent. to the typical form, the task has involved the capture and examination of about 3000 insects.

But these variations are almost endless; hardly any two specimens are alike; they merge almost imperceptibly from the typical into the *arete* or *cœca* form, and, further, these two forms are combined together in a number of sub-variations which constitute a most interesting study. And accordingly, after much consideration, we have, for our own convenience, divided the series in our collection into five main groups.

These may be described as follows: A. type + *arete*; B. type + *cœca*; C. *arete*; D. *arete* + *cœca*; E. *cœca*. It is a short description of these different groups which is to form the subject of this paper.

The typical underside of *A. hyperanthus* is, of course, well known. On each side of the insect eight ocelli are to be found, which are divided into three groups: the first, on the fore wing, consists of three ocelli; the second, on the hind wing, of two ocelli; the third, also on the hind wing, of three ocelli. These ocelli follow the marginal outline of the wings, though the second group, consisting of two ocelli, Nos. 4 and 5, is set a little further inwards from the outer margin than are the other two groups.

But even in the typical form there is a tendency towards the diminution in the size of the ocelli, which ultimately finds

expression in the variety *arete*; ocellus No. 4 is almost always conjoined with No. 5, and is frequently small and of the *arete* form, while ocellus No. 8 is almost invariably of *arete* form, though it stands quite apart from its predecessor, No. 7, being sharply separated from it by the lowest median nervure, and when we come to the variations it is in these two ocelli, as may be expected, that the differences from type are first seen; it is these ocelli which tend to become obsolete more frequently than the rest, or, in the *arete* forms, they are apt to degenerate into mere *cæca* points.

We find that the insects in which the typical is combined with the *arete* or *cæca* form are exceedingly rare. However, of the forms type + *arete* (group A), and type + *cæca* (group B), we have several examples. In these insects it is the ocelli on the upper wing which remain typical, and almost invariably they are ocelli Nos. 1 and 2 which keep the typical form; ocellus No. 3 is either *arete* or *cæca* in form, or else obsolete; but we have one interesting example in which the first three ocelli (those on the fore wing) are boldly typical, while all those on the hind wing are particularly minute *cæca* points. It should be noted, however, that ocellus No. 3 is more prone to obsolescence than any other; in every variation of the insect, as well as in the two groups just noted, it is the first to disappear.

We now come to the true *arete* variation, which we have ventured to designate as group C. In it the size of the ocelli are much reduced throughout; on the fore wing ocellus No. 2 tends to stand out most boldly and to approximate most closely to the typical size and form, while on the hind wing ocellus No. 6, the first of the last group, persists most strongly, closely followed, in this respect, by ocellus No. 5.

Group D, in which the *arete* and *cæca* characteristics are conjoined, affords many most interesting variations. As may be expected from what has been already said, ocelli Nos. 1 and 2 on the fore wing usually persist as *arete* when the remaining ocelli have passed into *cæca* points. We also find that in these examples ocellus No. 3 has completely disappeared, as has ocellus No. 4, while ocellus No. 8 has, in most instances, become either obsolete, or else is reduced to a mere microscopic point.

Finally we come to group E, the true *cæca* variation. In this form the fore wing is almost invariably obsolete, although we possess one or two specimens in which ocelli Nos. 1 and 2 remain as almost indistinguishable points. In the hind wing we generally find that only three ocelli are represented by *cæca* points, these being Nos. 5, 6 and 7, the last of the first group and the first two of the second group upon this wing. We have never met with complete obsolescence (var. *obsoleta*); we possess two or three specimens closely approaching this form, but in all of them the three *cæca* points, already mentioned, still remain quite clear, although exceedingly minute.

Asymmetry enters largely into these variations, forming a feature in about 33 per cent. of our specimens.

With regard to the upper side of this insect variation is much less common; we have, however, several specimens in which the ocelli on the upper side are almost as clear and as brightly ringed as those upon the lower side, and among these are two especially interesting varieties. The first approximates closely, on the under side, to var. *lanceolata*, all the ocelli being slightly enlarged and somewhat oval, with the exception of ocellus No. 3, which is present in the *arete* form on the right fore wing, and as a *caca* spot upon the left. The upper side of the insect is especially striking; the ocelli are as clear and bold as any on a typical under wing, with one interesting exception. Ocellus No. 3 and ocelli Nos. 4, 5 and 8 are entirely obsolete, there thus being only four bright ocelli on each side of the insect. The second variation is even more interesting: each upper wing is typical, but upon each lower wing are three bright and clearly defined *caca* points, representing ocelli Nos. 5, 6 and 7.

Finally we have endeavoured to arrive at the cause of these variations, but without much success. First we were inclined to consider them due to malnutrition, but quite half, both of our *arete* and *caca* varieties, are full-sized, well-grown insects, though others are perceptibly small. It seems, therefore, an open question whether nutrition, or the want of it, enters to any great extent as an active cause in the formation of these very interesting varieties.

Thursby Vicarage,
Carlisle.

DURATION OF STAGES OF *PYRAEIS ATALANTA*.

By F. W. FROHAWK, M.B.O.U., F.E.S.

I HAVE read Mr. Gervase F. Mathew's remarks on *Pyrameis atalanta* in the October number of this Journal, which do not agree with observations I have from time to time noted down. There is not the slightest doubt that the abundance of this species in this country in certain years is due to immigration in the spring, as is the case during the present year, when they first appeared in Essex on May 14th last, as recorded in the July number of the 'Entomologist.' Specimens occurring in Britain before may in all probability have hibernated in this country, but only a comparatively few appear to survive hibernation with us; it may be noticed that *atalanta* is always somewhat a rarity in early spring as compared with other hibernated butterflies. As a rule it does not make its appearance in any numbers (and then only in certain seasons) until the latter half of May or early in June, when the eggs are usually deposited which produce the first summer emergence about the end of July.

Mr. Mathew states—"The females take a considerable time in depositing all their ova . . . she may take a month or perhaps longer before she has finished laying." He also doubts this species being double-brooded, and that the eggs are laid from the middle of April, in early seasons, to towards the end of July.

There cannot be any doubt that a succession of broods of *atalanta* occur during favourable seasons, as I think the following notes will show, otherwise how can we account for small larvæ occurring at the end of September and even as late as well into October. These cannot be the result of spring parents, especially when the egg state lasts from five to ten days according to temperature.

The complete transformations of the summer emergence occupy from about forty-five to fifty days. Of one brood reared, the eggs hatched on the ninth day (rather longer than usual owing to temperature), larval stage twenty-three days and pupal stage seventeen days, total forty-nine days.

June 14th, 1894 (the first warm, bright day for the past two months), a captive female deposited 100 eggs and died a few days after.

June 27th, 1903, I observed a wild female depositing. She flew from one plant to another in quick succession, only resting about five seconds each time to deposit an egg—only one on a plant, each being laid on the upper surface of one of the smaller terminal leaves. These hatched on July 2nd—only five days in the egg state. Another also seen depositing in the same manner June 29th, 1903.

Mr. Mathew also states—"These larvæ do not vary very much." This surely is a mistake, as the whole colouring is liable to great variation in different individuals. September 17th, 1905, I found thirty-six larvæ on a small bed of nettles at Romney Marsh, Kent, in various stages from after the second moult to fully grown; the latter were of various colours, from almost entirely pale ochreous-whitish, to wholly black. The first one pupated September 22nd, and emerged October 12th; others emerged until the end of November. September 30th, 1908, found four larvæ at Thundersley, Essex; three fully grown, one moulted last time October 1st and pupated October 8th; imago emerged October 19th. In the Scilly Islands I found many larvæ in different stages, some quite small, during October, 1912; there produced imagines in November.

In these islands (Scilly) *atalanta* occurs on the wing throughout the winter during suitable weather. The late Lord Proprietor, T. A. Dorrien-Smith, told me that it was quite usual to see *atalanta* flying about the Tresco Gardens at Christmas-time. In such warm districts as South Cornwall and the Scillies this species has no true hibernating period, and merely retires for rest during rough, unsuitable weather.

At the present time *atalanta* larvae in different stages are still to be found in this neighbourhood and probably elsewhere throughout the country.

Thundersley, Essex :
October 5th, 1920.

NOTES ON BRITISH NEUROPTERA IN 1919.

By W. J. LUCAS, B.A., F.E.S.

ALDER FLIES (*Sialidae*). My first capture of the common species, *Sialis lutaria*, Linn., was one with damaged wings taken, 24 May, on a sports' ground in Kingston-on-Thames. Both sexes were captured at the Mill Pond, Leatherhead, on 31 May. Several Cheshire examples were sent for examination by G. A. Dunlop :— Runcorn, 19 May; Stretton Moss, 9 June : Moss-side, Acton Grange, 14 June; Appleton Reservoir, 24 May. From Stretton Moss on 9 June came also a specimen which I take to be *Sialis fuliginosa*, Piet. Unfortunately one of the clearest tests failed, the transverse nervure in the sub-costal area being missing in both forewings.

SNAKE FLIES (*Raphidiidae*). Both sexes of *Raphidia maculicollis*, Steph., were taken by beating at Boxhill, Surrey, on 31 May. *R. xanthostigma*, Schumm., was reported (F. W. Fordham) from the Selby District of Yorkshire, in which county it is not an uncommon insect.

BROWN LACEWINGS (*Hemerobiidae*). An example of *Hemerobius humuli*, Linn., was obtained by beating oak on 30 Aug., near Highland Water in the New Forest. One, which turned out to be *H. orotypus*, Walleng., was taken on the occasion of the S. London Society's Excursion to Boxhill on May 31. On the same occasion two cocoons of the genus *Hemerobius*, Linn., were obtained. One was constructed in the axil of a twig on a small branch of dead wood, the material being a very thin whitish lace-work of silk within a still finer lace-like web. The inner cocoon was elliptical, about 5 mm. long and about 2·5 mm. wide. From this a somewhat small imago of *H. quadriasciatus*, Reuter was bred on the 6th (or 5th) of June. The other cocoon (which was attached to a pine needle), though made of a somewhat open lacework of silk, was less transparent and of a yellower tint. It was elliptical, or perhaps slightly pear-shaped, about 7 mm. long and 3·5 mm. wide. It produced an imago of *H. concinnum*, Steph., on 8 June. In each case the pupa left the cocoon at one end, and was free from it before disclosing the imago.

GREEN LACEWINGS (*Chrysopidae*). One *Chrysopa flava*, Scop., was found on a tree-trunk at Netley Heath, Surrey, on 5 July (but it was not immaculate on the prothorax). *C. prasina*, Ramb.

(=*aspersa*, Wesm.), active for a *Chrysopa*, was taken by the side of Oberwater in the New Forest on 1 Aug. Of *C. vulgaris*, Sch., one was beaten from oak, on 30 Aug., by the side of Highland Water in the New Forest. On 7 June a *C. septempunctata*, Wesm. was taken from a fence in Fassett Road, Kingston-on-Thames, and another, apparently of the same species was found flying in the same road, but so teneral that the spots were not fully developed. *C. perla*, Linn. was met with at Boxhill on 31 May. A number of the same species were noticed on nettles in Princes' Coverts near Oxshott on 28 June, while rather large Lady-bird larvae and pupæ were seen on the same bed of nettles—apparently some prey to their liking were attractive to both. *Nothochrysa capitata*, Fabr. was taken in the Selby District of Yorkshire (Fordham)—a not uncommon insect in the county.

SCORPION FLIES (Panorpidae). Panorpas of the two common species were frequently seen in 1919. Though in several cases but one insect is mentioned, often others were seen, a specimen being taken as a sample. The first of the season was a male *P. communis*, Linn., taken near Horsley on 25 May; a male was secured near Leatherhead on 7 June; a male near Claygate on 10 June; a female at Effingham Common on 14 June; near Boldermere on 21 June, the occasion being an excursion of the S. London Society. All these were in Surrey. A male was secured in good condition by Blackwater in the New Forest on 30 July, while the same species was taken higher up the river on 1 Aug. G. T. Lyle captured a female at Gog Magog Hills on 3 Aug. My last capture was made at Rhinefield in the New Forest on 31 August. I first met with *P. germanica*, Linn., a male and a female the latter being teneral at Boxhill on 31 May; a female was taken near Claygate on 10 June; a female on Effingham Common on 14 June; near Boldermere on 21 June; and at Dames Slough in the New Forest on 1 August.

In connection with the var. *unifasciata* of *P. communis*, which I described in 'Entom.', 1919, p. 58, M. Lestage calls my attention to the fact that Klapalek had already used the term for a form of *P. communis*. It was not unifasciate by any means, while the Marlborough examples were. The variety, however, turns out to be one of the forms of Lacroix' var. *aperta*; so a new name is not necessary.

Kingston-on-Thames,
19 Aug. 1920.

NEW AND RARE BRITISH ALEURODIDÆ.

By J. W. HESLOP HARRISON, D.Sc.

As usual, during the present season, my friend Bagnall and myself have devoted our leisure time to increasing our knowledge of the British Zoocecidia—a pursuit, fortunately enough,

lending itself very readily to the accumulation of facts concerning the less studied insect orders. The records listed here are those of the *Aleurodidae*, and whilst mainly the results of my own work, they embody the notes on the same group made by Mr. Bagnall. Working as we do to suit one another it is impossible in many cases to dissociate our captures.

Advantage is taken of this opportunity to indicate the correct generic position of several of the species, which, up to the present, have all been lumped under *Aleurodes*.

Aleurochiton aceris, Geoffroy. Found very abundantly by me on *Acer pseudoplatanus* in the Swallowship Woods near Hexham, Northumberland. The only previous northern record was my own from *Acer campestris* at Gunnergate, N. Yorks.

Aleurodes quercus, Signoret. The only previous occurrence of this species in Britain with which I am acquainted is that of the specimen I captured at Corbridge, Northumberland, in 1918. This year I obtained it quite commonly from *Quercus* near Birtley, Durham.

Aleurodes spiraeæ, Douglas. Seen by Mr. Bagnall in Surrey, but detected by me for the first time in the northern counties at Waldridge, Co. Durham. I took both imagines and ova from *Ulmaria pentapetala* (*Spiraea ulmaria*).

Tetralicia ericæ, Harrison. Still, as far as I am concerned, curiously localised in its old station, near Chester Moor, Co. Durham, although a new colony has just been noted across the burn. Recently taken and recorded by G. B. Walsh from Skipwith Common in S. Yorks.

Tetralicia raccinii, Konow. New to the British fauna. An imago boxed by myself and pupæ cases noted by A. D. Peacock on *Vaccinium myrtillus* at Chopwell form the sole Durham records, whilst the occurrence of larvae on *Vaccinium oxyccoccus* at Prestwick Carr to Mr. Bagnall provides the complementary Northumberland locality.

Astrochiton arellanae, Signoret. First noted by Mr. Bagnall at Ovingham, Northumberland, and almost simultaneously by myself. Subsequently we both found it ubiquitous on hazel in the Derwent Valley, Co. Durham, whilst I detected it on the same shrub at Bishopton, S. Durham. Larvae were common on *Corylus avellana* at Chopwell on August 24th, 1920. New to the north.

Astrochiton carpini, Koch. I encountered this snowy fly both in the perfect and in the egg state on *Carpinus betula* at Chopwell, Co. Durham: likewise new to the north.

Astrochiton Bagnalli, sp. n. Quite common ovipositing on beech at Ovingham. Very like *A. arellanae*, but a little larger and duller in colour. I reserve fuller descriptions until early stages, other than ova, are available.

Astrochiton, sp. Also resembles *A. arellanae*, but not more

so than any two species of the genus *Aleurodes* approach one another. I do not venture to describe this until larvæ and pupæ are before me. Precisely as in the case of the most *Aleurodidae* neither the imago nor ovum offer sufficiently strong characters for differentiation. Quite common, with the usual egg batches laid in a blue waxy bloom, on *Ulmus campestris* at Chopwell, Co. Durham.

Aleurodidarum, sp. A species noted by Mr. Bagnall in great numbers on *Scrophularia nodosa*, but as he was not then studying the group he neglected to secure examples. Since then prolonged searches on the same lot of plants have been fruitless—a very common experience to the Aleurodid hunter; his motto must be “*Carpe diem.*”

SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

By F. C. WOODFORDE, B.A., F.E.S.

(Continued from p. 201.)

SPHINGIDÆ.

Dilina (Mimas) (Smerinthus) tiliæ.—Series of over 70, showing a great range of variation both in marking and coloration. In marking the variation lies chiefly in the central dark marks in the centre of the fore wing. In some specimens these are united to form an unbroken band, in others this band is broken up into three separate blotches, in others reduced to two, and in a few to one blotch, this lying in the central portion of the wing. Four specimens are asymmetric in marking. The coloration ranges from a greyish pink to almost white in the ground-colour of the central portion of the fore wing in the males, and over many shades of red-brown in the same part of the wing in the females. In two males from Reading, one taken wild, one bred in 1894, the ground-colour is almost white.

Smerinthus (Amorpha) populi.—A very fine varied series of 60. A remarkable series of 8 was bred by Mr. A. H. Hann in 1900 from ova deposited by a female which was brought to the Museum in June. The larvæ fed up very quickly, and the moths emerged as a second brood between July 25th and July 30th. They are small. Six are of a very pale whitish-grey colour, with very faint markings. Two are almost unicolorous pale buff.

S. ocellatus.—A series of 42 without any remarkable aberration. There are 5 hybrids, *populi-ocellatus*. One is from the Hope Collection, two from the Spilsbury, all three without data. Two were bred in Kent by Mr. J. W. Newman in 1917,

the male parent *S. populi*, the female parent *S. ocellatus*. All five are remarkably similar in colour and marking.

Acherontia (Manduca) atropos.—A fine series of 22, with full data.

Sphinx convolvuli.—Series of 29.

S. pinastri.—Three specimens, one from the Hope Collection, rather worn, without data, two from the Chitty Collection, labelled "Ex Coll. Haslehurst."

Phryxus (Deilephila) livornica.—Five specimens, one from the Spilsbury Collection, labelled "From Coll: of late Hugh Harrison of Bowden. Said to have been taken near Manchester, bought by me through Mr. Hodgkinson fr: Mr. Brockhoules' Coll: 1875. F.M.S." One from Reading, taken July 24th, 1870, by Prof. Poulton. One from the Sellon Collection, labelled "Fr: Burnell's Coll: This specimen was caught at Fifield, Berkshire, June 1881 by Mr. Micklem." One from the Meldola Collection, labelled "Dorset 1906. Canford Cliffs. June 4. 1906." One from the Spilsbury Collection, without data.

Hippotion (Chærocampa) celerio.—Four specimens. One from the Spilsbury Collection, labelled "Taken at Wakefield. fr: Coll: of Mr. Harrison, next of Mr. Brockhoules', thro' Mr. Hodgkinson." It is in perfect condition. One from the Meldola Collection, labelled, "In house: Hurstpierpoint, Sussex. Sept. 12th 1885. Given to Wm. Mitten and by latter to W. G. Wallace 1885. To R. Meldola from latter in 1914. (Jan. 11th)." In perfect condition. One from the Hope Collection—a mere fragment—without data. Another specimen from the Spilsbury Collection; much damaged.

Deilephila euphorbiae.—Four specimens. Two from the Hope Collection, one of them being labelled "Wells Coll." Two from the Spilsbury Collection, one of them labelled "Euphorbia fr: coll: of Mr. Harrison, bt: fr: late Peter Bouchard Esq. who had it fr: Coastguard's man. Then in Coll: of Mr. Brockhoules, bt: by Mr. Hodgkinson fr: him."

D. galii.—Eleven specimens. Three from the Hope Collection, labelled "Wells Brit. Coll." Two from the Spilsbury Collection without data. Three from the Sellon Collection, labelled "Vaughan's Coll." On one a further label has "S. J. Capper. 1876." A fourth specimen from the Sellon Collection is labelled "Bennett's Coll." and a fifth "Burnell's Coll."

Daphnis (Chærocampa) nerii.—Two specimens. One from the Hope Collection, a female, very old and faded, but otherwise perfect. One from the Chitty Collection, both without data.

Metopsilus (Chærocampa) porcellus and *Chærocampa elpenor*.—Long series of each species, but without any noteworthy aberration.

Macroglossa stellatarum.—Long series. Two from Chitty Collection, with dark brown hind wings, with no data.

Hemaris fuciformis and *tityus*.—Long series without aberration. Three specimens of *fuciformis*, freshly emerged, show many scales on the wings.

Dicranura bicuspis.—Series of 25. Nine from Tilgate Forest, Sussex, 9 from North Staffs. taken by myself, 1 from Shifnal, Salop, 5 unlabelled from Spilsbury Collection, 1 unlabelled from Hope Collection.

Stauropus fagi.—Series of 31. Five specimens taken in 1892 were originally melanic, but are now faded to very dark brown. This also applies to a remarkably fine female labelled "Marlow," bred by the late Canon Barnard Smith.

Drymonia trimacula and *chaonia*.—Fine series of both species. One specimen of the latter from the Pogson Smith Collection, bred from a larva taken in Bagley Wood, has the central band entirely filled up with the dark ground-colour, and the white lines bounding it are very indistinct.

Notodonta phœbe = *tritophus*.—There are two specimens without data from the Hope Collection. Both are in perfect condition.

Lophopteryx cuculla.—Series of 16. Ten labelled "Marlow," eight of which are from the Sellon Collection.

Odontosia carmelita.—Series of 17. Seven from the Sellon Collection, labelled "Sussex." One from the Champion Collection, bred April 17th, 1910, from a larva taken at Chobham in September, 1909.

Ptilophora plumigera.—Series of 27. Only six with data, three of which are from Bucks, three from Kent.

THYATIRIDÆ.

Palimpsestis duplaris.—A long series from various localities. Eleven melanic specimens from Staffs.

Polyploca ridens.—A specimen without data from the Spilsbury Collection has the basal and outer portions of the fore wing white.

(To be continued.)

NOTES AND OBSERVATIONS.

COLIAS EDUSA IN BUCKS.—*C. edusa* has been quite plentiful on the Bucks Chilterns this year, the last one seen being a perfect female at Casdene on September 26th. *C. hyale* has not come to my notice, but in addition to the ab. *helice* I recorded last month, my brother has caught one very large specimen at Ventnor, and seen several others. It is quite remarkable the numbers of *P. atalanta* there are still to be seen in this district.—WALTER PIERCE; Queen's Road, High Wycombe.

COLIAS EDUSA IN DEVONSHIRE.—I have seen about twenty *edusa* and one *helice* in this district since writing my last note (*antea*, p. 234).—E. D. MORGAN; 27, Sanford Crescent, Chelston, Torquay, October, 4th, 1920.

COLIAS EDUSA AND *HYALE* IN HANTS.—We have had another *edusa* year in this neighbourhood, the last having been in 1917. The first specimen seen was on August 5th, but as this was at some distance from its headquarters I imagine it was out before that date. This was a month earlier than in 1917, when the first seen was on September 3rd. They were mostly taken on the Portsdown Hills, though four were seen along the roadside near the town. Well over 100 specimens were seen altogether, though not more than twenty at the outside were females. Not a single ab. *helice* was noticed, nor any *hyale*. A couple of boys, however, from the neighbourhood took four of the latter species on the same hills and saw a fifth. The last specimens of *edusa* seen was on September 13th. After that we had dull or wet weather. The 23rd, however, was very warm and sunny, but though I made another expedition to the Downs not a single specimen was to be seen. In 1917 they continued till October 2nd.
—(Rev.) J. E. TARBAT; Fareham, Hants.

COLIAS EDUSA IN KENT.—During the early part of August *Colias edusa* was not uncommon in one restricted locality near Orpington, North Kent, flying over the rough slopes of a hillside. I took specimens on August 8th and 15th, and must have seen nearly a dozen on the latter date. Although in the locality each week-end until the middle of September I never saw the species again after August 15th. Perhaps the sharp ground frosts experienced towards the end of that month accounted for its disappearance.—G. B. HONGSON; 3, Bassett Road, North Kensington, London, W.

COLIAS HYALE AND *C. EDUSA* IN KENT.—I spent a short holiday at Deal with the idea of catching *Colias hyale*. During my stay I visited Dover, St. Margaret's Bay, Folkestone, Sandwich, Ramsgate, Margate, Broadstairs and Birchington, but saw no *hyale* at any of these places. On September 8th, however, I was very pleased to catch, within three miles of Deal, four specimens, three of which were in perfect condition. *Colias edusa* was very scarce and worn, but *Pyrameis cardui* was abundant and in good condition.—H. O. WELLS; Inchiquin, Epsom.

COLIAS EDUSA IN MIDDLESEX.—I took a worn male at Enfield on August 11th. I have not seen the species here since the last great *edusa* year.—H. M. EDELSTEN; Forty Hill, Enfield.

COLIAS EDUSA IN SUSSEX.—I captured a female specimen at Slindon on June 5th.—H. M. EDELSTEN; Forty Hill, Enfield.

COLIAS EDUSA AB. *HELICE* IN SUSSEX.—A specimen of *Colias helice* was captured by a young nephew of mine, aged seven, at Bognor towards the end of August last. Considering the age of its fortunate captor it is in excellent condition.—B. W. NEAVE; Lyndhurst, 35, Queen's Road, Brownswood Park, N. 4.

COLIAS EDUSA AT CHICHESTER.—*Colias edusa* has not been uncommon in this locality this season. My first record of its appearance is on June 9th, when it was seen flying in the garden of our neighbours and friends, Mr. and Mrs. Humphry.—JOSEPH ANDERSON; Chichester.

PLUSIA MONETA AT CHICHESTER.—This moth was taken by Mr. Humphry on a window-curtain in their house on June 16th, and an empty cocoon in our garden.—JOSEPH ANDERSON; Chichester.

BUTTERFLIES IN BUCKINGHAMSHIRE.—*Dryas paphia*: I took a perfectly fresh ♂ near Princes Risboro' on August 16th. *Argynnis aglaia* was also very common there and in fine condition. *Agriades corydon* was not out in this locality on August 8th. I went again on August 16th, but only saw 2 ♂ and 1 ♀. I did not go again so do not know if it appeared later. I presume the wet season had killed off the larvae.—H. M. EDELSTEN; Forty Hill, Enfield.

PYRAMEIS ATALANTA IN FORFARSHIRE.—It may be of interest, in view of the notes which have appeared in the 'Entomologist' suggesting an unusual immigration of *Pyrameis atalanta* this year, to record the occurrence of the species in my garden here. A specimen was seen flying about on one or two of the fine days we had about the middle of September. On the 26th two were seen, both in good condition, and on October 3rd a very fine large example was under close observation as it sunned itself on various flowers. It had a distinct white spot on the red band of each fore wing, the spot being in a line with the row of white spots towards the apex of the wing. In my experience *atalanta* is uncommon in Scotland, this being the third occasion only on which I have seen it during the last thirty years.—A. E. J. CARTER; Monifirth, Forfarshire.

PYRAMEIS ATALANTA IN ARGYLL.—On September 22nd I saw a specimen of *Pyrameis atalanta* at Tarbert, Loch Fyne, in Argyll. It was a bright, sunny day, and the butterfly seemed to be in fairly good condition. This is the only *Pyrameis* I have seen during a stay of two months in the Clyde district, although *Aglais urticae* has been quite common.—A. STEVEN CORBET; 72, Union Street, Greenock.

ZEPHYRUS BETULÆ AT LIGHT IN N. DEVON.—On August 16th at 11.15 p.m. (summer time) I had occasion to enter an upper room, taking with me a candle. Two or three minutes afterwards I noticed what at first I took to be *Selenia bilunaria* walking up the glass of the window. On closer examination I discovered it to be a male *Z. betulæ*. On going to open the window it flew on to the sill. I then boxed it.—B. G. ADAMS; 15, Fernshaw Road, Chelsea, S.W. 10.

LATE EMERGENCE OF LYCENA ARION.—On July 11th I found a larva of *L. arion*, about half grown. It fed until about the 24th, and changed to a pupa on the 28th, emerging on August 29th.—B. G. ADAMS; 15, Fernshaw Road, Chelsea, S.W. 10.

MANDUCA (ACHERONTIA) ATROPOS IN SUSSEX.—On September 13th, 1920, a specimen of this moth was taken on the beach at Bexhill-on-Sea by a friend of mine (not a collector), who took it to the curator of the local museum, who kindly identified and chloroformed it. The moth was sent to me on September 19th. The upper wings, which are unusually dark, are a little rubbed, but otherwise the moth is in very fair condition. I understand a specimen of this moth has not been found in the district for several years.—A. M. LONGHURST; Artro, St. James's Avenue, Hampton Hill.

MANDUCA ATROPOS IN WALES.—I beg to record the capture of *Manduca atropos* near Carnarvon on September 9th. It was resting under the eaves of a house and squeaked loudly on being disturbed. This is my second record for this county. A female came to light in August, 1914, and was brought to me in good condition.—G. B. MAULY; Shenstone, Church Street, Malvern.

PHYRXUS (DEILEPHILA) LIVORNICA.—This was abundant in the Kalamaria district of Salonica in 1918 at the flowers of the rose of Sharon at early dusk. A few came to light.—GEO. S. ROBERTSON, M.D.; Bronllys, 72, Thurlow Park Road, Dulwich, S.E. 21, September 24th.

ON REARING *DEILEPHILA LIVORNICA*.—With further reference to my rearing this species (*antea*, p. 190), I very much regret to say the attempt proved a complete failure. When I last wrote about 100 were fine healthy larvae quite full grown, and some few had gone under the moss. The weather turned very cold and dysentery set in, killing off the whole brood. The few that went down died before turning, with the exception of one; this pupa went black and rotten.—L. W. NEWMAN; Bexley, Kent.

HERSE (SPHINX) CONVOLVULI IN CORNWALL.—I found a fine specimen of *H. convolvuli* sitting on my garage door on October 5th.—LEONARD B. STOPPER; Penryn, Cornwall.

LATE APPEARANCE OF *SPILOSOMA MENTHASTRI*.—On the evening of October 4th I took under an electric lamp in this town a specimen of *Spilosoma menthastri* in very good condition. I have never known of such a late occurrence of this species before. Can it possibly be a case of a second brood—though I have never heard of such? On the same evening I saw a specimen of *Bryophila perla*, which is rather late.—(Rev.) J. E. TARBAT; Fareham, Hants.

ZYGENA HIPPOCREPIDIS IN SOUTH HAMPSHIRE.—I was much interested in reading Mr. Postans' experience of this insect (*antea*, p. 212). I found it rather scarce in the Netley district in the grounds of the Royal Victoria Hospital in 1917; there were very few *Z. filipendulae* on the same ground later, but several flourishing colonies of *Z. trifolii* in the immediate neighbourhood.—GEO. S. ROBERTSON, M.D.; Bronllys, 72, Thurlow Park Road, Dulwich, S.E. 21.

NOTE ON *MELIANEA FLAMMEA*.—In Chippenham Fen in June this year females of this species were noticed in some numbers ovipositing in the dead flower-heads of the reeds of the previous year. Previously in the Norfolk Broads I had noticed them ovipositing in the sheathing leaves of dead reed stems; in the latter case the egg is flattened by the pressure and is coin-shaped, while in the former it is round. It struck us as rather unusual that they should select the old flower-heads, as most of the Wainscots prefer the sheathing leaves to place their eggs in. Probably as they hatch the same year they do not require so much protection as those which do not hatch until the following spring.—H. M. EDELSTEN; Forty Hill, Enfield.

LEUCANIA VITELLINA AND *L. UNIPUNCTA*, ETC., IN CORNWALL.—On September 6th I took *L. vitellina* on valerian here in my garden, a second on October 7th, and a third on October 14th—the last much

worn. These two were on sugar. On September 27th and October 1st I took two *L. extranea* (*unipuncta*) on sugared foliage, both on the same bush. They seemed so thoroughly to enjoy the sweets that they had to be pushed into the box with the finger. Both were beneath the leaf on which they were feeding. With the second I boxed a rather worn specimen of *L. albipuncta*. The common autumnal moths, with the exception of *A. nigra* and *P. flavigincula*, have been very scarce.—LEONARD B. STOPPER; Penryn, Cornwall.

THAMNONOMA BRUNNEATA IN THE NORFOLK BROADS.—The recent captures of this insect in Staffordshire, Wicken Fen and Bishops Stortford, as recorded in the August, September and October numbers of the 'Entomologist,' are interesting, and it is evident that it is not confined to the North. While staying at Horning with Mr. E. A. Bowles in 1905 he captured a specimen which he knocked out of a sallow bush by day. Is it not possible that it is a sallow feeder where *vaccinium* does not grow?—H. M. EDELSTEN; Forty Hill, Enfield.

LEPIDOPTERA IN SICILY.—During a fortnight's stay at Taormina, between Messina and Catania, Sicily, from May 6th to 20th of this year, I secured the following: *P. podalirius*, *P. machaon*, *P. brassicæ*, *P. rapæ*, *P. daplidice*, *L. sinapis* (1), *E. cardamines*, *E. ausonia*, *G. rhamni* (1), *G. cleopatra*, *L. camilla* (1), *P. cardui*, *A. pandora* (1), *M. cinxia* (3), *M. didyma* (2), *S. semele*, *P. megera*, *P. egeria*, *E. janira*, *E. ida* (2), *C. pamphilus*, *T. w-album* (1), *P. phœas*, *L. batica* (2), *L. astrarche*, *L. icarus*, *L. cyllarus* (2), *S. alceæ* (1), *H. thaumas*, *H. actæon*, *H. sao* (1). The species which were most scarce are shown with brackets after them, the numbers given being the total taken, and no others of these species were seen. In Sicily the season this year was early, with dry and sunny weather throughout my visit. Entomological pursuits were only secondary in my case, or the above list of thirty-one species would undoubtedly have been longer. In the 1897, 1912 and 1914 volumes of the 'Entomologist' various notes and articles on Sicilian butterflies were published, the number of species therein recorded for the island being sixty-one, including all mine above except *T. w-album*. (In Malta, within eighty miles of Sicily, only sixteen species are found.) The writer of one of the articles stated that Taormina, although noted for its beautiful surroundings, was a poor place from the collector's point of view. During my visit no day-flying moths were common except *Syntomis phegea*; at night numbers of small moths were attracted by an arc-lamp facing open country just at the end of the town, but these were devoured by half a dozen or more bats that continually circled about the lamp. It was noticeable that any moths which settled on the lamp-column, walls or ground remained untouched. The largest moths I saw attracted were *Deilephila livornica*, which seemed able to withstand several attacks from the bats, but finally fell to the ground stunned, where the bats left them unmolested.—H. F. HUNT; Senglea, Malta, September 14th, 1920.

SPHECOLYMA INANIS.—Having been on the look-out for this species for some years now, I can feelingly congratulate Mr. Morley (p. 213) on his capture. Mine, I hope, is to come. I presume he is aware of Dr. Newstead's record ('Ent. Mo. Mag.', 1891, p. 41) of the larvæ as

swarming in a nest of *Vespa germanica* in October, 1889, at Ince, Cheshire, from which he bred flies in July, 1890. He also found larvae of *Homalomyia vesparum* in the same nest, but bred only two flies from them. Probably this note about *inanis* was the evidence on which Dr. Meade made the statement Mr. Morley quotes.—C. NICHOLSON; 35, The Avenue, Hale End, E. 4, September 26th, 1920.

METACUS PARADOXUS AND SPHECOPIAGA VESPARUM.—It will doubtless interest Mr. Morley and others to know that these two species have been bred by an acquaintance of mine from nests of *V. vulgaris* taken in the vicinity of Chingford, and I have portions of a comb containing three cocoons of the ichneumon, as well as one of the flies and three of the beetles, the latter all males. I have been hoping for these species from local nests for some time, but have not met with them myself up to the present.—C. NICHOLSON; 35, The Avenue, Hale End, E. 4.

SCARCITY OF VESPA.—Wasps are extremely scarce in this district this year. I know of one nest only—a strong *germanica*, which I hope to take at the first opportunity—but I have seen *vulgaris* about in one or two places and in small numbers. It would be interesting to know whether the scarcity is general all over the country. At Eastbourne (last three weeks in July) I saw very few wasps, a few each of *vulgaris*, *germanica* and *sylvestris* being the sum total, and the weather was, on the whole, not bad there at the time, but the last week was cool and rather showery. No doubt the cold snap in April killed off a lot of queens.—C. NICHOLSON; 35, The Avenue, Hale End, E. 4.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—August 26th.—The President in the Chair.—Mr. H. Main exhibited the early stage of *Mantis religiosa* from Southern France, and several spiders, and gave notes on their habits as observed by him.—Mr. Bowman, a male *Parasemia plantaginis* in which the hind right wing was suffused. It was of a brood of which fifty-five out of sixty pupae emerged in four days.—Mr. Barnet, series of *Hydriomena furcata*, including green, light-banded, variegated and very dark forms from South Devon, very yellow forms of *Ematurga atomaria* from Limpsfield, and a *Plebeius aegon* from Oxshott with an unusually wide white submarginal band on the underside.—Mr. Sich gave details of the habits of the newly-hatched larvae of *Coleophora ibipennella*.—Mr. Edwards and Mr. Grosvenor, many forms of the polymorphic species *Papilio memnon* from the Indo-Malay region.—Mr. Edwards then read a series of notes on the species.—H. J. TURNER, Hon. Editor of Proceedings.

OBITUARY.

WE regret to hear that Mr. E. Anquetil, of The Burroughs, Hendon, died on September 22nd last.

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NOTES ON THE VARIATION OF *PERONEA CRISTANA*,
FAB., WITH DESCRIPTIONS OF SIX NEW FORMS,
AND THE REASONS FOR SINKING THE NAMES
AT PRESENT IN USE OF SIX OTHERS.

By W. G. SHELDON, F.Z.S., F.E.S.

Soon after my paper on this species in the 'Entomologist,' vol. 1, was written, I became aware that numerous points in the varietal nomenclature were doubtful, and required clearing up.

Further study convinced me that the solution of most of these problems could only be obtained by an inspection of the series of the late Sidney Webb, which was the only one in Britain, so far as I knew, that could be considered a fairly complete one. I made arrangements to visit Mr. Webb early last year, but unfortunately at the appointed time he was seized by what proved to be a fatal illness, and my visit became impossible; the whole series, however, passed into my hands in April last, and thus I have been able to study the material which I desired to see.

The series is undoubtedly the most complete that was ever got together, for Webb purchased the whole, or practically the whole of the series of the late J. A. Clark, including all his types; and also that of the late Dr. P. B. Mason; further, it includes all the specimens which were in the collection of the late Fred Bond—not a few in number, and extensive purchases from the following amongst other collections: H. Burney, Howard Vaughan, S. Stevens, A. F. Sheppard, F. O. Standish and P. Harper, all of whom made a special effort to acquire *cristana* forms. In all there were over 1200 specimens, and representatives of every form that has ever been named.

Most of the specimens are in excellent condition, but many of them are old: quite a number in fact are set on the old round-headed pins that generally went out of use about the year 1850. The great bulk, however, are set on white or gilt pins of the form now used, and they would thus date—or most of them would—from 1850 to 1880. The remainder, of which I think the great majority came from Clark, are set on black pins, and would thus date from, say, 1880 to 1910, after which I do not think any additions were made. Of course these dates are approximate, and those given for the specimens on black pins

would not apply to all the specimens, because many collectors still use gilt or white pins.

The consequence of the antiquity of the specimens is, that with an insect like *cristana*, which for a small moth greases very badly, there is a great amount of verdigris apparent, which will make it necessary to re-pin and reset practically the whole.

Unfortunately they are very inadequately labelled. In his earlier years Webb put small circular labels on the pins, with the name of the collection from which they were derived written thereon; all the Bond specimens are so labelled, and some of the Mason and Burney specimens also; but those derived from Clark are almost entirely without data, with the exception of the types, all of which have a special label. Clark scarcely did any labelling, and the others none at all.

Sidney Webb acquired most of his specimens late in life, when his eyesight, probably never very good, judging from the fact that he habitually used glasses comparatively early, was manifestly unequal to the task of discriminating between the various aberrations of this protean species, and although he had grouped his specimens according to the known aberrational names, many of them were wrongly named, and some of the series grouped under one name consisted of examples of two or even three forms.

After he acquired Clark's *cristana* Webb wrote a paper on them in the 'Entomologist,' vol. xlivi, pp. 198 and 265, and vol. xliv, pp. 289 and 308, presumably to correct certain errors in Clark's monograph to be found in the 'Ent. Record,' xiii.

This paper is an interesting one, valuable in recording facts respecting certain forms, of which possibly he alone of all men living was aware. Unfortunately in addition to defective eyesight, leading him to make numerous mistakes, he had a very superficial knowledge of the subject, whilst of the law governing scientific nomenclature he does not seem to have known even the elements; the result is that he made more mistakes than those which he corrected.

One obvious source of misconception of the named forms of *cristana* is the coloured plate in Clark's paper (*loc. cit.*) of the types of his named forms. It is known that Clark was very dissatisfied with this plate; he had good reason to be so, for it is a very inferior one, and the figures are quite unreliable. This is only fully apparent when one compares it with the actual types. I have the following observations to make on these figures:

Fig. 1, ab. *nigrocristana*. Clark says: "The difference between this aberration and typical *cristana* is very marked, the form having a black button instead of a white one." In the figure the button is of a rather lighter brown than the surrounding portions of the wing.

Fig. 10, ab. *fusca*na. Clark's description of this aberration applies to a form as typical *cristana*, but with "a large self-coloured button." The button in the figure is considerably lighter in colour than the surrounding areas of the wings. Webb says (*loc. cit.*, p. 265) of Clark's type-specimen that it "does not agree with his named series: the central tuft, instead of being large, is almost wanting, whilst a red line from the tuft to the costa near the apex is very noticeable; not one of his series of six shows this red line, and the disc of their wings is in each case unicolorous light brown, vitta pure white, and the central tuft large and rust coloured. This new name had better be dropped."

There is something to be said for not giving names to aberrations of the type form of *cristana*, which both *nigrocristana* and *fusca*na are, for the colour of the button only, for this varies from pure white in the type, light cream to dark cream, light brown to dark brown, and brownish-black. But there is no difficulty with ordinary eyesight in locating examples of ab. *fusca*na. There can be no doubt that Webb saw something in Clark's type that does not exist, and did not see something that does exist. I have this type before me, labelled as such; it most certainly *has* a large button, and there is not a vestige of the red line that Webb refers to as being present.

Turning to the series of ab. *nigrocristana* and *fusca*na in Webb's Collection, I find there are twenty-six examples in all, six of which are labelled *fusca*na and twenty *nigrocristana*. As the specimens labelled *fusca*na agree in number with Webb's description of the number of Clark's series, one would presume they were all in the collection of the latter as *fusca*na, but on examination they are found to be three of *fusca*na and an equal number of *nigrocristana*.

Turning to the specimens labelled *nigrocristana*, one finds seven of them to be this form, and thirteen *fusca*na, and amongst these so-called *nigrocristana* I find also Clark's labelled type of *fusca*na! Amongst Webb's series of *nigrocristana* are five examples of *fusca*na which are unlabelled, but which probably came from Clark's Collection; it looks as if these included the three missing examples which Webb says were in Clark's series of this aberration, for which the former had unwittingly substituted examples of *nigrocristana*. But on referring to the catalogue of Clark's sale one finds that there were eight examples of *fusca*na in addition to the type; and therefore it may be that all these five specimens were in the Clark Collection.

I have dwelt upon Webb's connection with these two aberrations in detail because it is very typical of his series as a whole, and his paper. It does not, I think, take much discernment to diagnose what has happened: evidently after the Clark specimens left Stevens' Rooms, and before they were put in the places they

finally occupied in Webb's Collection, there must have been a general mix-up, and his eyesight did not suffice to correct the errors then made.

Fig. 4, ab. *nigrosubrittana*. I have dealt with an error in the 'Entomologist,' vol. 1, p. 271, and I have only further to add that Clark's description is correct, and the figure, which has the superiors dark brown with the button slightly lighter, is wrong; both Clark's type and his other specimens, five in number, have the ground-colour and button black.

This figure more nearly portrays ab. *lichenana*, Curtis.

In my paper (*loc. cit.*) I make the statement that Mr. South has a number of this form (ab. *lichenana*) in his collection. I have since found that this statement, for which I alone am responsible, is an error; the specimens in question are without "the large patch at the base of the inner margin white" which is included in Curtis's description of that form.

Ab. *lichenana* is apparently an exceedingly rare form: the only examples of it I have seen are two, which are in the Webb Collection, but there were half a dozen catalogued in the Clark sale; one wonders what became of them.

Fig. 12, ab. *transversana*. In this figure the vitta is much lighter in colour than it is in the type, and also in the other three examples of the series, in which it is almost unicolorous with the disc of the superiors.

Fig. 16, ab. *charlottana*. This is the most misleading figure in the plate. Clark's description agrees with the type, but the figure does not in the following details: (1) The white triangular basal blotch in the figure is outlined in red on the outer as well as on the inner margin; there is no trace of this colour on the outer margin in the type, nor does Clark allude to it in his description. (2) In the figure the white discal spot immediately follows the button; in the type and in Clark's description, between the button and the blotch the red streak is continued. In the type the length of the continuation of this red streak is about 1·5 mm. (3) The light striations between the white blotch and the hind margin are in the figure much too pronounced, and the ground-colour of this area is too light. (4) If the figure is examined with a lens it is seen to have a considerable amount of red dotting which is not apparent in the type.

Webb suggests that *charlottana*, Clark, may equal ab. *curtisana*, Desvignes, of which the latter says: "Similar to the last (*subcapucina*), varying in having a very faint fulvous streak extending from the base to the button, which is of the same colour." If one omits from this description the words "very faint" it exactly fits in with the type of *charlottana*, and as the lightness of the red or fulvous line depends upon the condition of the specimen there does not seem any reason to doubt but that this view is correct.

There are three examples in the Webb series, two of which are mounted on the old round-headed pins, and thus they almost certainly date back to before 1850, or to the period in which Desvignes wrote his paper (1845). The red in these examples is distinctly less bright than in the very beautiful type, which was taken in Folkestone Warren in 1898 by Mr. Purdey.

One of these specimens was labelled by Webb "Dr. Mason's Colln." and in the catalogue of Mason's sale what is almost certainly this specimen is named ab. *curtisana*. This sale was held in 1905, and as Clark's paper was written in 1901, Mason, who had adopted Clark's names, evidently did not identify his specimen as *charlottana*, Clark; and if he had, as is most probable, not seen the actual type and judged by the figure, there is no reason why he should have done so. I think in naming his specimen *curtisana* he was correct, that the two forms are one, and that *charlottana*, Clark, should fall before *curtisana*, Dsvgs. It is not improbable that Mason's specimen was Desvignes' type, but of course there is no means now of proving this. Webb mentions that examples of *curtisana* are "lost to knowledge unless *charlottana* be identified with it." Certainly I have not seen one, though there is an example in the National Collection which purports to be it; this, however, is obviously ab. *tolana*, Dsvgs.

Fig. 19, ab. *nigrana*. The colour of this figure is very dark brown. Clark's description does not mention any dark brown tint, nor does his type show any; it has only different depths of pure black.

I will now deal with some further points in Webb's paper (*loc. cit.*) which require correction.

On p. 267, vol. xlivi, he writes of ab. *rufinigrana*, Clark: "A distinction without a difference" (from *nigrana*). "Of this form Clark remarks (*loc. cit.*), the chocolate-coloured margin which is totally absent in *nigrana* constitutes the difference. Possessing both the type (quite unlike the figure) and his series we are forced to say there is no chocolate line whatever as described." "The name *rufinigrana*, as one of non-importance, should be dropped altogether." This is one of the most erring statements in Webb's paper. Ab. *rufinigrana*, and Clark's type of it, is an exceedingly distinct form, and it was only Webb's defective eyesight that led him into the error. As I have pointed out in my paper (*loc. cit.*), it is a dark purple-brown form and has no resemblance to the pure black ab. *nigrana*.

Abs. *nigrocostata*, Clark (not *nigroruficostata*, as written by Webb—Clark never used this name), and *albonigrana*, Clark. Webb's incorrect remark that these figures appear to have been transposed arose through his getting hold of a reprint of Clark's paper, in all or some copies of which I am informed the figures actually were transposed. In the original figure ('Ent.

Record,' vol. xiii, plate 8) they are not transposed, therefore Webb's use of the names transposed is not correct.

Ab. *sericana*, Hub. Of this form Webb says: "Similar to *desfontainiana*, but no central tuft: or if it is present at all it is extremely small." Here, again, Webb falls into an error, into which he was probably led by Desvignes, who writes of this form "the same (as *desfontainiana*) without a button." But Hübner's fig. 83 has a very distinct orange button, and the ground-colour of the superiors is much darker than that of *desfontainiana*, Fab. Later on I have something further to say anent ab. *sericana*, Hüb.

Ab. *intermedia*na, Clark. Webb speaks of most of Clark's series as being ab. *rittana*, and suggests that the varietal name is therefore of little value. Most of Clark's series may have been *rittana*, though I much doubt this statement, but whether they were or not does not matter one iota; his type agrees with his description, and it certainly is not ab. *rittana*. The two forms are as distinct as many others, and they are readily distinguishable.

Ab. *fulvostriana*, Webb. This name was given by Webb (*loc. cit.*, vol. xliv, p. 291) to specimens of which he says: "In Bond's cabinet are three, in Clark's one, and I have seen others; of lightly mottled specimens easily distinguishable from the last (*prorittana*, Desvgs.) the vitta is distinct and white, tinged along the middle with faintest yellow, head and thorax pale cream. I propose for this variety the above name, which was written on the ticket placed by Bond below the specimens."

We are here in face of a decided muddle! It is to be noted Webb does not give the slightest hint of the colour of the superior's disc, or of the button, and for this reason it is quite impossible to grasp what his specimens actually were like, from the description. Turning to the actual specimens in the series I find they are six in number. There are the three Bond specimens, labelled as such by Webb, the one from Clark similarly labelled, and two others, both unlabelled, which one presumes are the "others" mentioned by Webb. Two of the Bond specimens and the two unlabelled ones are of one form, with reddish-brown discs, dark button, and what I should call a cream-coloured vitta, head and thorax. That is to say they had a less yellow vitta, head and thorax than one finds in the bulk of those known as *fulvostriana*, Desvignes, but otherwise they are not distinguishable from it. The third Bond specimen is of quite another type and does not belong to this group at all, but it resembles a lightly blotched form of ab. *seminotana*, Curt., except that the head, thorax and vitta are cream coloured. The Clark specimen has the disc of a dark mouse colour, quite different from the other examples in all respects with the exception of the cream vitta, head and thorax. This specimen was placed by Webb, not amongst the others, but amongst one of his series of ab. *fulvostriana*, Desvignes!

It will be seen that we have under this name three forms, all widely apart, and as there is no indication in the shape of a label which of them Webb took as his type, and his description is not sufficiently in detail to indicate his meaning, it is plain *flavostriana*, Webb, is not established, and that therefore it must fall.

(To be continued.)

NEW SPECIES OF NOCTUIDÆ FROM THE PHILIPPINES.

By A. E. WILEMAN AND RICHARD SOUTH.

(Continued from p. 124.)

Trachea discisignata, sp. n.

♂. Head and thorax pale brown mixed with reddish, crown of head reddish brown; abdomen pale brown. Fore wings pale brown, powdered with darker, dotted with black, and barred with brown on costa; subbasal line indicated by a black linear mark on the costa; antemedial line blackish, interrupted, preceded on costa by a brown, elongate mark, indented and more clearly defined towards dorsum; reniform and orbicular stigmata outlined in black, the former enclosing a dark brown lunule, and filled in with whitish: a dark brown spot under the median nervure, its outer and lower edge limited by a black line which runs to base of wing: post-medial line dark brown, originating in fifth black dot on the costa, sinuous, excurred about middle; subterminal line sinuous, brown, outwardly edged with paler; fringes brown, darker at ends of veins, a pale line at base. Hind wings pale brown, darker on terminal area. Underside pale brown, all the wings with darker discal lunule and two almost parallel lines beyond.

Expanse, 36 mm.

Four male specimens from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), January 12th, 1912. One of the specimens is rather greyish in the tone of ground-colour.

Comes nearest to *T. dinarana*, Hampson.

Stictoptera (?) *apicalis*, sp. n.

♀. Head, thorax and abdomen dark chocolate brown: fore wings dark chocolate brown; antemedial line black, indistinct, edged on each side with pale brown, slightly curved, terminating in a pale ochreous mark on dorsum; orbicular stigma black, elongate, faintly edged with pale brown; reniform stigma pale brown, partly outlined in black; postmedial line pale brown, indistinctly edged with black, crenulate and sinuous, terminating in a pale ochreous mark on dorsum; subterminal line indicated by a sinuous series of pale brown dots, becoming linear towards dorsum; a pale ochreous apical mark, outwardly diffuse and inwardly edged with black; terminal dots pale ochreous; fringes dark chocolate brown, dotted with pale ochreous

at base. Hind wings fuliginous brown, fringes paler at tips. Underside fuliginous brown, apical mark on fore wings as above, some pale ochreous striae on outer third of costa.

Expanse, 42 mm.

A female specimen from Haight's Place, Panai, subprov. Benguet, Luzon (7000 ft.), November 15th, 1912.

Nigramma linea, sp. n.

♂. Head and thorax pale ochreous brown, collar deep brown. Fore wings ochreous brown slightly tinged with reddish, outer fourth clouded with brown; orbicular and reniform stigmata paler; brown marks on outer half of costa and a brown mark between the stigmata; subterminal line greyish, indistinct, obtusely angled below costa, thence inwardly oblique to dorsum, preceded by a transverse series of four blackish-brown dots; a blackish-brown oblong mark about middle of dorsum and blackish dots on termen; fringes of the ground-colour mottled with darker. Hind wings pale fuscous brown, darker on margins. Underside fuscous brown, some pale dots on costa of fore wings towards apex.

♀. Similar to the male, but with a large brownish cloud at base of costal area of the fore wings, the terminal area more heavily clouded with brown.

Expanse, 30 mm.

A specimen of each sex from Haight's Place, Panai, subprov. Benguet, Luzon (7000 ft.), captured in 1912, the male taken on December 1st, and the female on November 11th.

Comes nearest to *N. lapidaria*, Walk.

Sinna poweri, sp. n.

♂. Head white, thorax white, marked with crimson, abdomen white. Fore wings white, marked with tawny brown; subbasal line broad, oblique postmedial line rather broad, sinuous, oblique; postmedial line incurved below middle, where it edges a tawny brown cloud; subterminal line outwardly oblique from costa to the termen just above dorsum; the transverse lines are united by longitudinal bars of the same colour, thus giving a spotted effect to ground-colour; a black mark at apex preceded by three black marks forming a curve from costa to termen; fringes white, towards tornus marked with black at base. Hind wings white, silky. Underside tawny brown on fore wings, white on hind wings.

Expanse, 34 mm.

A female specimen from Baguio, subprov. Benguet, Luzon (5000 ft.), March, 1913.

Comes near *S. calospila*, Walker.

Aiteta olivana, sp. n.

♂. Head and thorax olive brown, abdomen greyish. Fore wings greyish, tinged with pink on central half and powdered with olive on

dorsal half; a large olive-brown cone-like patch on middle of costa not extending to dorsum, outlined in white; subterminal line olive brown, only distinct towards costa; terminal area dusky. Hind wings fuscous, darker on terminal area. Fringes of all wings dark grey. Underside of fore wings dark fuscous, costa brown; of hind wings pale fuscous, darker towards termen.

Expanse, 36 mm.

A male from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), January 12th, 1912.

Carea cuprea, sp. n.

♂. Head and thorax red brown, abdomen greyish brown. Fore-wings cupreous, suffused with grey brown, costa whitish; antemedial line brown, slender and oblique; postmedial line brown, slender, slightly indented below costa and before dorsum; subterminal line brown, slightly sinuous; discoidal dot black, a dusky line from its lower edge, not extended to dorsum; fringes rufous, tipped with white towards dorsum. Hind wings copper-red, inner area greyish; a pale line at the base of the copper-red fringes. Underside rufous, whitish on dorsal area towards base of fore wings.

Expanse, 42 mm.

A male from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), November 30th, 1912.

Allied to *C. leucocraspis*, Hampson.

Parallelia mediijascia, sp. n.

♂. Head and thorax rufous brown, abdomen greyish brown. Fore wings rufous brown; antemedial line dark brown, slender, outwardly oblique; medial line blackish, inwardly oblique and edged with violet grey, followed by a dusky parallel line, area beyond and up to the dusky and serrated postmedial line tinged with violet grey; some obscure, ochreous clouds between the post-medial and subterminal lines, subterminal line blackish, diffuse, curved from apex to tornus, area enclosed violet grey; terminal line brown, preceded by black dots between the veins; fringes whitish, brown tinged towards base. Hind wings dark fuscous, medial band and fringes whitish. Underside fuscous; all wings have a blackish discoidal dot and traces of a line beyond; terminal area of fore wings as above.

Expanse, 58 mm.

A male from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), November 8th, 1912.

Comes nearest to *P. duplexa*, Moore.

Lyncestis albesigna, sp. n.

♂. Head and thorax grey, the latter with a black line in front; abdomen grey, tinged with brown towards basal and anal extremities. Fore wings grey with brownish marks on basal two-thirds of costa, blackish on middle of dorsum; antemedial and postmedial lines

brownish, the former indistinct below median vein, the latter excurved round cell; reniform stigma represented by a dark grey lunule with two black specks at its lower end, placed on the inner edge of a pale spot; terminal area clouded with darker clouds, forming an irregular, curved band extending from apex to dorsum one-fourth from tornus; fringes dark grey. Hind wings white, terminal border black, tapered towards the anal angle; fringes white. Underside white, black bands towards termen of all wings, fringes as above.

♀. Similar to the male, but the blackish on dorsum is rather broader, and extends from postmedial line almost up to base of wing.

Expanse, ♂ 45 mm., ♀ 42 mm.

The male-type from Manila, prov. Rizal, Luzon, taken at sea-level, July 12th, 1912; the female type from Los Baños, Luzon, 1912 (Ledyard).

Allied to *L. melanochista*, Meyrick.

THE MACRO-LEPIDOPTERA OF COUNTY TYRONE.

BY THOMAS GREER.

(Continued from p. 221.)

HETEROCERA.

Sphingidae.

Amorpha populi, L.—Abundant, larvæ on sallow, willow and poplar; the red-spotted form of larva not unfrequent.

**Smerinthus ocellatus*, L.—Larvæ abundant on sallows in the bogs; also in similar situations near Cookstown (H.); over thirty larvæ found on a small sallow bush near Stewartstown, the female observed on several occasions flying late at night over sallows.

Manduca atropos, L.—Caledon (K.), a fine specimen at rest in a barn near Newmills.

Sphinx convolvuli, L.—Caledon (K.); a number appeared in gardens at Cookstown, September, 1917, and I received a battered example from a friend taken in the town.

Emmorpha elpenor, L.—Very abundant in the county; have seen it in great numbers at *Iris pseud-acorus* at Lough Neagh.

**Macroglossa stellatarum*, L.—Not common, but abundant in the autumn of 1899.

Hemaris tityus, L.—Common in the county; often abundant in mountain glens.

Notodontidae.

Cerura furcula, L.—A number bred from larvæ on sallow near Stewartstown and at Lissan; several larvæ near Cookstown (H.) and at Favour Royal (K.).

Dicranura vinula, L.—Abundant and widely distributed : have taken the larvæ on sallows above 1000 ft. on the mountains.

**Pheosia tremula*, L.—Larvæ locally abundant on poplars near Stewartstown, Loch Fea, and near Cookstown ; imago at light at Lissan.

Pheosia dictæoides, Esp.—Larvæ not uncommon on birch (but rarer than the preceding species) at Lissan and in the Lough Neagh district, also near Favour Royal (K.).

Notodonta ziczac, L.—Abundant and widely spread ; larval on willow, sallow and poplar.

Notodonta dromedarius, L.—Larvæ abundant on alder and birch, imago at light ; also abundant at Favour Royal (K.).

Lophopteryx camelina, L.—Abundant generally in the county ; the local form of a dark reddish brown.

Pterostoma palpina, L.—Rare ; Altadiawan (K.).

Phalera bucephala, L.—Larvæ abundant almost everywhere ; imago much less common.

Pygæra pigra, Hüfn.—Larvæ common on sallows near Lissan, and in abundance on dwarf sallows on the margin of Lough Fea (H.) and at Favour Royal (K.).

Thyatiridæ.

Habrosyne derasa, L.—Fairly abundant at Favour Royal (K.), also in this district at sugar and grasses.

Thyatira batis, L.—Abundant in woodlands ; the form without the pink tinge on the spots not uncommon.

Palimpsestis duplaris, L.—Not uncommon at Favour Royal and abundant at Altadiawan (K.) ; not rare near Cookstown and at Lough Neagh ; the local form var. *argentea*, Tutt.

**Polyploca floricornis*, L.—Several bred from larvæ found near Tamnamore, Lough Neagh.

Lymantridæ.

**Orgyia antiqua*, L.—Not uncommon locally in September and October, and larvæ often abundant on birch and heather.

**Dasychira fascelina*, L.—Larvæ not rare on heather near Tamnamore, Lough Neagh, but nearly always stung. I took a female at rest June, 1915.

Pœcilocampa populi, L.—Kane states that this species is abundant at Favour Royal ; not uncommon in this district at light, November and December.

Lasiocampa quercus, L., var. *calluna*.—Abundant on moorlands and bogs.

Macrothylacia rubi, L.—Abundant almost everywhere ; larvæ often very numerous on the moorlands.

Cosmotriche potatoria, L.—Locally common at Favour Royal (K.), also in the Lough Neagh district.

Saturniidae.

Saturnia paronia, L.—Very common and widely spread; larvae on heather, sallow and meadow-sweet.

Drepanidae.

Drepana falcataria, L.—Favour Royal, rare (K.); not uncommon near Tamnamore; several pale forms approaching the white Rannock variety.

Drepana lacertinaria, L.—Locally abundant at Favour Royal and Altadiawan (K.); near Stewartstown and Lough Neagh larvae very plentiful on birch bushes.

Cilia glaucescens, Schiff.—Not uncommon in this district and at Favour Royal (K.).

Nolidae.

Nola confusalis, Hr. S.—Not common at Favour Royal (K.); several near Lissan, Cookstown.

Chlöephoridæ.

Hylophila prasinana, L.—Common and widely distributed.

Sarrothripinae.

Sarrothripa revayana, Tr.—Not common; near Favour Royal (K.); larva on sallow and imago at ragwort, near Stewartstown.

Arciidæ.

Spilosoma menthastrum, Esp.—Very abundant, and var. *ochracea* not uncommon; some examples very dark.

Spilosoma lubricipeda, Esp.—Abundant generally.

**Diaphora mendica*, var. *rustica*, Hb.—Common and widely distributed in this district (E. Tyrone), the males varying from pure white, through buff, to a pale smoke-colour; one example with discal area white and margin of fore wings smoke-colour; females often with only the dot at base of fore wings indicated.

**Phragmatobia fuliginosa*, L.—Not uncommon on heathery ground, and the var. *borealis*, Stand., rarely.

Parasemia plantaginis, L.—Locally abundant on moorlands and bogs.

Arctia caia, L.—Abundant; the larvae very common on roadsides and hedge banks in the spring; a fine female bred very similar to that figured in South's 'British Moths,' pl. 84, fig. 1, but with the hind wings tinted with orange and the spots very small.

Hipoerita jacobaeæ, L.—Very abundant; a form occurs locally with the usual upper marginal spot on the fore wings, divided into two small twin spots; larvae on *Senecio vulgaris*, as well as *S. jacobaea* (H.).

Lithosiinae.

**Atolmis rubricollis*, L.—Not common; beaten from Scot's fir, Lissan, and at rest on bracken fronds near Tamnamore.

**Lithosia deplana*, L.—Rare; near Tamnamore.
(To be continued.)

AUGUST BUTTERFLIES IN THE LANNION DISTRICT: CÔTES DU NORD, BRITTANY.

By JOHN E. H. BLACKIE.

BRITTANY is once more becoming a popular province in which to spend an August holiday, and for this reason I think a short account of the butterflies to be found there during this month may be of interest to readers of the 'Entomologist.' Mr. Rowland-Brown tells me that the greater part of Brittany has been explored by M. Charles Oberthür and his collectors, but that his work was confined chiefly to the departments of Morbihan, Finistère and Ille-et-Vilaine. Côtes-du-Nord is therefore a rather unworked country. I do not pretend to have made a systematic search of the department, but I hope that my notes may serve as a guide as to what one may expect in this part of the province.

My headquarters were Trestrignel in the commune of Perros-Guirec, a small village on the coast, about seven miles north of Lannion. From here my observations extended to Tonquédec and Kerfons, the site of an ancient ruined château, six miles south of Lannion; to Ploumannach and Trégastel, three and a half miles west of Trestrignel; to Louanec, two miles east of Perros-Guirec; and to Tréguier—a cathedral city—twelve miles east of Trestrignel.

The Lepidoptera were interesting, but not anything out of the way, and this was probably due to the wind-swept and woodless type of country on the coast and the lateness of the season. Inland, towards Lannion, there were large chestnut woods where *D. paphia* was fairly common, but all along the coast were heaths and bracken, less prolific in butterflies than might be expected, although *L. quercus* careered up and down them in large numbers. *C. quadripunctaria* was fairly common, both the typical form and ab. *lutescens*. My chief object was the collecting of butterflies, but I also took or noticed the following moths: *M. stellatarum*, *A. secalis*, *P. gamma*, *A. viridaria*, *C. immanata* and *Z. trifolii*.

Adopœa flava.—Common at La Clarté (near Trestrignel), but only occasionally at Trestrignel. Rather pale forms.

Thymelicus acteon.—Common during the earlier part of August at Trestrignel. Fond of sitting on thistle-heads in sheltered spots.

Aricia medon.—One at Trestrignel. Not common.

Polyommatus icarus.—Common everywhere. Females inclining to ab. *brunnea*: very few ab. *cerulea*. No interesting variation.

Zephyrus quercus.—One ♀ late in the month at Trestrignel.

Chrysophanus phlaeas.—Fairly common. One ab. *cæruleo-punctata*. No other variation whatever.

C. dorilis.—Fairly common everywhere. ♂♂ and ♀♀ about equally divided.

Pieris brassicæ, *P. rapæ* and *P. napi* were all quite common everywhere. The forms appeared to be identical with the English ones, except that *rapæ* and *napi* had rather fainter black markings than is usual in our *gen. aest.*

Colias edusa.—Occasionally on the coast, and becoming much commoner further inland, especially towards Trégnier. Just outside this city I saw, but failed to take, an ab. *helice*.

Papilio machaon.—One at Trestrignel. I understand that this butterfly is generally fairly common on the channel coast especially in Normandy, so that it was perhaps strange that I did not see more.

Dryas paphia.—Fairly common in the woods. ♂♂ much more abundant than ♀♀. I noticed it at Tonquédec, Louanec and Trestrignel.

Argynnis cydippe.—One worn specimen near Trestraor (commune of Perros). Probably common earlier.

Brenthis euphyroe.—One in a marsh at Louanec. Rather a small example. It is generally double-brooded all over France.

Pyrameis cardui.—Occasionally during the earlier part of August. *P. atlantica*.—Common everywhere.

Vaessa io.—Fairly common. Very fine and large.

Aglais urticae.—A few; not common.

Euponia polychloros.—I saw one or two, and my cousin, Mr. Ronald Blackie, took one at the beginning of the month.

Hipparchia semperi.—Common everywhere during the earlier part of the month. The "Rock" and "Heath" Graylings were both common.

Pararge egeria.—Two forms. The English form *egeria* appeared occasionally; *intermedia* was common everywhere. I took two specimens with basal spots yellow and outer spot white. *P. megaura*.—Common everywhere. A few pale specimen.

Epinephela jurtina.—Common everywhere. The ♀♀ exhibited a very interesting variation in the colour of the apical patch. I took a fine series, which I have tabulated as follows: (1) Apical patch tawny-orange. Common: *jurtina*. (2) Apical patch creamy yellow. Rare: ab. *intermedia*, n. ab. (3) Apical patch upper half yellow, lower half white. Not common: ab. *semialba*, n. ab. (4) Apical patch very pale yellow, almost white. Not common: ab. *tincta*, n. ab. (5) Apical patch completely white. Fairly common: ab. *alba*, n. ab. *E. tithonus*.—In thousands everywhere. A few pale examples.

Coenonympha pamphilus.—Very common. One or two fine ab. *lyllus*, and several with eye-spots reduced to points.

NOTES AND OBSERVATIONS.

CHANGE OF GENUS-NAME.—I propose the name *Charixena* in place of *Philpotia*, Meyrick, applied to a genus of *Glyptipterygidae* in 1916 ('Trans. N. Zeal. Inst.', vol. xlviii, p. 416), finding that the latter name had been used by Capt. Brown for a genus of Coleoptera in the preceding year.—E. MEYRICK; Thornhanger, Marlborough.

XYLINA LAMBDA IN CAMBRIDGESHIRE.—I had the good fortune to secure a fine male specimen of this rare insect on October 7th last. I did not identify it until to-day when I took it off the setting-board. As I have only recently taken up collecting again after an interval of over thirty years, I distrusted my luck until I had my identification confirmed by two more experienced collectors, Mr. W. Farren and the Rev. C. E. Raven, Dean of Emmanuel College. The insect was beaten out of ivy in the neighbourhood of Cambridge about 11 p.m. on October 7th, and was in such perfect condition that it was probably very recently emerged. The wing expanse is 36·6 mm. (1½ in.) and the marking agrees closely with the description in Barrett (vol. vi, pp. 34–36), but the beautiful dark lambda mark on the fore wings is much clearer than in the figures given by South and Barrett.—SIDNEY E. CAMPBELL; The Bursary, Christ's College, Cambridge.

SCARCITY OF LYCENA ARION, ETC., IN CORNWALL.—After an absence of nine years I again visited the Cornish locality for *Lycena arion* for a few weeks' stay in June and July last. I was immediately struck by the changed appearance of the ground. When I first visited the district twenty years ago one could get about any of the hills in fair comfort, but now most of the ground is so overgrown with dense masses of gorse, bracken, bramble and heather that it is impossible and too painful a proceeding to wade through in many places. Nor is this to the advantage of *arion*, as with this larger growth the ground plants, thyme, etc., have been choked out to a great extent. Consequently I was not surprised to find the species in greatly diminished numbers—certainly not more than 20 per cent. of what it was even ten years ago. It has almost gone from the large coombe which used to be its headquarters, but here the trouble is due to fire and cultivation, the hill slope having been accidentally burnt out a few years ago, and the top of the hill—the old breeding-ground—being now under the plough. I tried this coombe on several occasions and from it secured only five good specimens altogether. Another steep bank (inland) where several specimens used to be taken was a complete failure, not one putting in an appearance. I experienced several days during my stay when not even a single *arion* was to be seen, although the whole of the regular haunts were looked over, and this notwithstanding the fact that I had the ground to myself for the greater part of the time. I do not put the scarcity down to over-collecting altogether,

but rather to a natural cause—the usual disappearance of a species from a locality no longer able to support it. Here and there about the coombes there still remain patches where the growth is much as it used to be, and it was only round about such places that *arion* was to be taken. I have to thank this circumstance for my good fortune in turning up *arion* larvæ and pupæ in early July. By a lucky chance I was led to examine an ant's nest which was built up against an upright slab of rock: by pulling this away it left a clean-cut section of the nest, and then exposed to view in the galleries were four pupæ, the lowest of them being about 4 in. below the crown of the nest. The imago of this one would have had 6 or 7 in. of gallery to crawl through before reaching the open air. From this situation one can quite understand the rubbed thorax and bases of wings so often seen in specimens otherwise perfect. Feeling greatly cheered after this find I procured a garden trowel, and following the hint contained in the first nest turned over several others. Most were blanks, but fifteen pupæ were secured altogether, and two full-fed larvæ, which pupated on July 7th and 15th, the imagines emerging on August 3rd and 10th—rather late dates it may be thought, but Mr. B. G. Adams, in last month's 'Entomologist,' records an emergence even later. One of the specimens from larva has dark grey fringes—a form I have not previously seen. One nest had contained six pupæ; three of them had already emerged when turned up: the remaining three produced dwarfs—clear enough evidence that dwarf specimens are caused by "short rations." Not only *L. arion* but also other noted Lepidoptera of the district have suffered a like diminution. Of *Leptosia (Leucophasia) sinapis* I saw but three specimens: *Dianthuria luteago* v. *nicklini*, nine in a fortnight (a lot of the food-plant, *Silene maritima*, has been buried by falls of cliff, and the remaining portion has most of its flowers destroyed by large black slugs). *Eupithecia constrictata*, three imagines and one larva. *Polia nigrocineta*, extremely scarce, larvae in ones only. *Toxocampa craccae* has maintained itself the best of all, but even so it is not in half its old numbers; its food-plant has also considerably lessened. *Melitaea artemis* appears to have gone completely: not one was to be found, although several suitable marshes are still there. Doubtless the scarcity is partly due to the poor season, but after the war-time respite—particularly in the case of the moths—a much better result should have been seen.—G. B. OLIVER: High Wycombe.

GONEPTERYX RHAMNI IN CHESHIRE.—On October 2nd I took a ♂ *Gonepteryx rhamni* in Pettypool Park, Delamere. This butterfly is very rare in Cheshire. Day's list gives only six records for the county, the most recent being in 1902.—A. H. THOMPSON: 54, Church Road, Northwich.

COLIAS HYALE IN HAMPSHIRE: A CORRECTION.—Since writing a note which appeared in the November number of the 'Entomologist' on the occurrence of *Colias hyale* on Portsdown, I have been informed by Mr. Postans, of Portsmouth, who has been there, that the four insects taken by the boys referred to are really specimens of *C. eisneri*, var. *leuce*, and not *hyale*. I suggested to the boys

at the time I met them that they had caught *helice*, but they were so positive that it was not so and that they knew the variety quite well that I accepted their statement as correct. I am sorry for the mistake, and hasten to correct it.—(Rev.) J. E. TARBAT; Fareham, Hants.

COLIAS EDUSA AND PYRAMEIS ATALANTA, ETC., IN BRIGHTON DISTRICT.—*C. edusa* was recorded near Brighton in early June, and others seen between Shoreham and Arundel. I took a ♀ flying on the Patcham Downs on June 6th, but although it remained alive ten days no ova were deposited. I examined this specimen closely. It was not freshly emerged; a chalky whitish stain appeared on the upper wings, probably caused by damp when hibernating, much resembling the stain I have seen on some of the spring-flying *Gonepteryx rhamni*. During August and up to the middle of September *edusa* was seen at Angmering, Goring, Worthing, Lancing, Shoreham, Hove, Brighton streets, Dyke Valley, Roedean, Falmer, Glynde and Lewes. I took them in half-dozens at some of these places—among which were three *C. hyale*. A collector friend of mine took between six and seven dozen, but he stated he walked sixty miles to obtain them. The unsettled weather experienced during August and September was all against taking a quantity. On September 28th I knocked down a ♀ *edusa* with my cap; it was flying very slowly and low over the stones on the Brighton Beach, otherwise I could not have captured it. It was a very fine specimen as if just emerged from pupa. It may be she formed one of the numerous parties of butterflies, mostly *P. atalanta*, which for the last two months have been observed by occupants of boats at sea, flying towards the coast of Sussex. During this pleasant summerlike weather I revisit some of the likely spots to see if a fresh brood is about. I have read in Newman's book on butterflies of a collector who took several hundred *edusa* in October and November, and history has a way of repeating itself. To-day (October 11th) I found several larvae and pupae of *P. atalanta* on nettles on my allotment at Brighton. These will all probably mature this year if kept warm, but what if the weather turned cold and inclement for a long period? It might properly be assumed the pupae would probably lay over to the spring before emerging. Five years ago I took some pupæ in October, and to my surprise they came out on Christmas Day. The usual crimson bordering on the lower wing in some of these was of a light brick colour. All butterflies usually taken here have been abundant this year.—F. G. S. BRAMWELL; Brighton.

COLIAS EDUSA IN MIDDLESEX.—I have not come across *C. edusa* in Middlesex this year under my own observation, but a friend informs me that he saw an example flying on the railway-bank just outside Uxbridge Metropolitan station on a fine day in the first week of October.—H. ROWLAND-BROWN; Harrow Weald, October 23rd, 1920.

COLIAS EDUSA IN SURREY.—I saw two specimens of *C. edusa* flying over a field of lucerne at Horley, but caught neither.—D. G. SEVASTOPULO; Colvin House, Haileybury, Herts.

COLIAS EDUSA REARED FROM OVA.—This has not been a real *edusa* year in Sussex. From the first week in August to the end of the month there were a good many about but they were never really thick. I went out for them on a good many days, and the most I took was ten on one day. The proportion of females to males was about 1 to 4 out of a total of thirty-six taken. I took one var. *pallida* on August 30th, but no specimens of *C. hyale* were seen. I never saw one *C. edusa* more than a mile from the sea, and I am convinced they are all immigrants. I saw most by far within 100 yards of the sea, and all appeared to come from south and to have a tendency to fly north. From a small batch of eggs laid by a damaged female about August 20th I got six larva hatched September 1th. They pupated October 14th to 19th. Imagines emerged on November 11th, including one ab. *pallida* (*helice*). The larvae were fed on young large-leaved clover grown up since the field was mowed for cattle-feed, and they did well on it. Others of the same batch were fed on lucerne. The larvae are quite unenterprising creatures, and will hardly take the trouble to move from the stale food to fresh. They progress by a jerky glide, each little jerk taking them about $\frac{1}{2}$ inch. They can be kept quite safely on a bunch of clover in water without being in any way confined. Last week I was playing golf at Rye on the 12th, and I saw a couple of *C. edusa*. I went on the 13th with a net, and in about two hours' sunshine I noted about thirty flying on the sandhills just above high-water mark and took seven perfect ones, all small males. I think they are late arrivals, or unmated males which have survived. No females were observed. I saw one *Polyommatus icarus*, four *Chrysophaenus phœas*, and a good many *Plusia gamma*, otherwise the *C. edusa* had the dunes to themselves. They were feeding on a common yellow flower I do not know the name of.—A. BINGHAM CRABBE (Major); Grand Avenue Mansions, Hove.

POLYGNIA C-ALBUM, ETC., IN SOMERSET.—I took one *P. c-album* in the garden here on September 11th and saw one *C. edusa* on September 19th. Throughout September *P. atlantica* was very numerous and in fine condition. Very few *Vinessa io* or *Aglais urticae* seen and no *Pyrameis cardui*.—WALDEGRAVE; Chewton Priory, Chewton-Mendip, Somerset.

POLYGNIA C-ALBUM.—Mr. Paskell's note of this species at Wanstead Park (*antea*, p. 235) reminds me that it used to occur at Enfield. I have two specimens in my collection which my father took here in 1872. He often told me that he had noticed it in some numbers as a young man. I have not seen the species here during my lifetime.—H. M. EDLUSTON, Forty Hill, Enfield.

NOTE ON *AGLAIS URTICÆ*.—While in my dressing-room on August 14th, about 4 p.m., a specimen came in through the open window, fluttered round the room and into a cupboard, where it at once took up a position on the ceiling. It is still there, and has shown no inclination to go out again, however fine the weather has been. Is this not rather an early date to commence hibernation?—H. M. EDLUSTON; Forty Hill, Enfield, October 12th, 1920.

PYRAMEIS ATALANTA AT ENFIELD AND IN THE CITY.—This insect has been exceptionally common here this autumn. I counted no less than fifteen on one *Buddleia* bush. It is still about in the garden to-day (October 12th). I may add that I saw a specimen at Liverpool Street Station on October 8th. I presume it had "arrived by train."—H. M. EDELSTEN; Forty Hill, Enfield.

PYRAMEIS ATALANTA IN MAY.—In the July number of the 'Entomologist' (No. 686), Mr. W. M. Christy and Lieut.-Comm. R. A. Dickson, R.N., record the occurrence of *Pyrameis atalanta* in May. It will doubtless be of some interest to mention that a specimen of this butterfly was brought to me on May 15th, which was taken by Miss Gertie Purchase flying over a hedge at Petersfield. It has been abundant over flowers in the garden, and generally here, during September particularly. I first noticed *Cyaniris argiolus* on April 6th and *Pieris brassicæ* on May 7th.—JOSEPH ANDERSON; Chichester.

PYRAMEIS ATALANTA IN BERKSHIRE.—In view of the interest attached to *Pyrameis atalanta* this year additional records may be of interest. During October, 1920, this species has been very much in evidence along the banks of the river Kennet, near Reading. I have only seen one *Vanessa io*, and that on October 5th.—A. STEVEN CORBET; 32, Hamilton Road, Reading.

PYRAMEIS ATALANTA, AB.—From a number of larvæ of *P. atalanta* gathered at Folkestone in September last I have bred a couple of specimens having the bands on all wings of an orange yellow tint.—G. B. OLIVER.

PYRAMEIS ATALANTA, AB.—I caught a specimen of *P. atalanta* with four subapical spots: unlike the one in the Hope Collection the second spot is missing. I caught it on a scabious at Horley, Surrey.—D. G. SEVASTOPULO; Colvin House, Haileybury, Herts.

AGRIADES CORYDON IN BUCKS, 1920.—With reference to Mr. Edelsten's note on the late appearance of *Agriades corydon* at Princes Risboro' last August (*antea*, p. 261), it may be of some interest to record that I found the species fully out and abundant on the hills round Hambleden, South Bucks, on August 1st, the only day I visited the locality.—S. B. HODGSON; 3, Bassett Road, North Kensington, London, W.

AGRIADES CORYDON IN BUCKS, 1920.—Your correspondent, Mr. H. M. Edelsten (*antea*, p. 261), is mistaken in supposing that *Agriades corydon* was almost absent from the Princes Risboro' Hills this last season. I found it in great profusion from the end of July to the end of August. I saw one specimen early in July, which, curiously enough, was very badly worn! This seems rather extraordinary.—WALTER PIERCE; Queen's Road, High Wycombe.

AGRIADES CORYDON VAR. SYNGRAPHIA.—I regret to have to record the practical extinction of *Agriades corydon* on what was the "ab. syngrapha" ground in the Bucks Chilterns. I was there from

July 23rd till August 8th last and saw only two males. Another collector I met reported one, and Mr. H. A. Leeds, who spent nine days there in mid-August, met with another. These four males, as far as I am aware, are the only four native-born *corydon* seen there this year. Not only the "*syngrapha*" ground but also the "all-type" ground some little way off has suffered a like fate. Here, where the species in '17 and '18 simply swarmed, this year I saw under thirty specimens, six being females. Mr. Spiller reports the butterfly very scarce in the Oxon Chilterns, whilst on the Hertfordshire side Mr. L. Goodson, of Tring, says it has been quite abundant, but with no special variety beyond *semi-syngrapha*. From Royston, where I went on August 9th, I sent Mr. Leeds over 500 live females with a sprinkling of a few males. These he very kindly put out on the old *syngrapha* ground in the hope that they would mate with any possible straggler of the local race, and so, perhaps, eventually re-establish the colony, or shall I put it a colony, as the re-entrance of *syngrapha* appears to be very remote. The disappearance of *A. corydon*, I think, is due to two main causes. Firstly, parasites: In 1917 *corydon* was fairly plentiful, though not swarming (I am alluding now to the *syngrapha* colony). In 1918 its numbers had lessened by half, one portion of the ground being quite blank. 1919 saw the butterfly absolutely scarce. I gathered seventy larvae in that July which produced six butterflies only, the remainder, with the exception of a few diseased larvae, being stung. Some few threw out dipterous grubs when full-fed, but the majority pupated and from the pupae emerged a species of Hymenoptera. Secondly, disease: I believe it is generally agreed that variation, excepting striation, is due to disease or weakness, also that gynandromorphism denotes degeneration. I don't think there was ever a colony of *A. corydon* which produced more varieties per thousand specimens than did the *syngrapha* strain! One day in August last year I saw less than fifty *corydon* out of which three were varieties, one *syngrapha* and two *obsoleta* (one whitish, and one of the complete form with merely faint traces of the lunules). Mr. H. Rowland-Brown reported ('Entom.', vol. I, p. 236) the finding of one var. *syngrapha* at another locality some miles from its regular ground. In 1917 and the following year I put out a fair number of the variety on another ground which his description fits, but personally did not see any result from it. The species was scarce there last year as in other parts, but I did not visit the place this year so cannot say how it has fared. G. B. OLIVER; Stocksbridge, September, 1920.

CHrysophanus phleas AB. *ceruleo-punctata*.—Mr. Jacobs' note (*antea*, p. 233) indicates that the blue-spot form of *C. phleas* is a native of marshy places. On September 18th of this year I took six specimens at Quarndon (near Derby) on a patch of dry heathy ground, where was also an abundance of gorse and thistles. Of these butterflies four were of the blue-spot form. The following Saturday I took six more, and of these five were blue-spotted forms. I also captured a large number on some very marshy ground near Duffield, but none of these bore any trace of the blue marking, nor, indeed,

was there any appreciable variation from the ordinary form in any of them. These results seem to contradict the conclusion arrived at by Mr. Jacobs. The point raised is a very interesting one and in my opinion is well worth further investigation.—N. BLACKWELL WOOD; 114, Arthur Street, Derby.

CHRYSOPHANUS PHLEAS AB. CÆRULEO-PUNCTATA.—Mr. Jacobs' notes on the blue-spotted form of *Chrysophanus phleas* reminds me that the one spot where I can always find this aberration is a very marshy spot near Winchester. The other specimens on the dry ground near by were not so noticeably variable.—WALTER PIERCE; High Wycombe.

MANDUCA ATROPOS IN SUSSEX.—Two specimens were taken in September, one at Lancing and the other in Frances Street, Brighton.—F. G. S. BRAMWELL; Brighton.

PHRYXUS LIVORNICA IN SUSSEX.—A larva of *P. livornica* was taken by a lad, who found it feeding on bedstraw growing on the Patcham railway-bank, Brighton, in August last.—F. G. S. BRAMWELL; Brighton.

PHRYXUS LIVORNICA BRED IN ENGLAND.—A caterpillar was found on some allotments at Dover on June 24th, and was taken to Mr. Mannering by a man named Brown. Mr. Mannering brought it to me on the 26th and asked me to breed it for him. It went to earth the same day. It spun a cocoon on the top very fragile, and which eventually it fell out of. It changed to a pupa a week later, and the perfect insect emerged on September 28th at 7 o'clock p.m., and was fully developed at 9.10 p.m.—F. P. ABBOTT; Dover Museum.

HIPPOTON (CHÆROCAMPA) CELERIO, L., IN NORFOLK.—An example of this hawk moth was taken by Mr. Edward N. Mennell at Burnham Overy, King's Lynn, on October 10th. It was flying round a lamp, and was secured in perfect condition. I have seen an excellent coloured figure of the insect drawn by Mr. Mennell, which leaves no doubt as to its identification.—A. D. IMMS, D.Sc.: Rothamsted Experimental Station, Harpenden.

RARITIES IN THE PLYMOUTH DISTRICT.—*Leucania vitellina*: With further reference to my note (*antea*, p. 236) I have pleasure in recording the capture in my garden of three more specimens, all perfect, viz. two on September 25th and one on October 5th. My friend Mr. H. H. May, of Plymouth, also took six specimens during the week ending October 9th on the north coast of Cornwall. *Laphygma exigua*: A single male specimen in my garden at sugar on September 29th. Mr. May also took one, a female, on October 7th on the north coast of Cornwall. *L. unipuncta (extranea)*: A splendid specimen of this rare species at sugar in my garden on October 1st. *Sphinx convolvuli*: Two females on October 7th, one male October 13th in my garden. Several others seen about the *Nicotiana affinis*. It would appear from the above records, and the fact that such species as *edusa*, *atalanta*, *gamma*, etc., have been plentiful, that the early part of this year must have been exceptionally favourable to immigration, and it is of interest to determine what were the particular

conditions that led to this result. It is also to be hoped that other observers will record any captures of the above-named moths which may have come under their notice, so that some idea may be formed as to the area of distribution in this year of these immigrant species.—R. H. MOORE; Heathfield, Plymstock.

LEUCANIA VITELLINA IN DEVON.—I took perfectly fresh *Leucania vitellina* at ivy on October 11th in this district.—E. D. MORGAN; 27, Sanford Crescent, Chelston, Torquay.

LEUCANIA VITELLINA IN KENT.—On October 5th last a specimen of *L. vitellina* was captured at sugar in my garden on the edge of the cliffs at Kingsgate. September is given as the best month. Unfortunately I was away with Mr. Mellows in September, but will make a note for next year.—R. STANWAY PARRIS; "Beachleigh," Kingsgate, Kent, October 13th, 1920.

PACHYGASTRIA TRIFOLII.—Larvae of this species taken late in June this year attained the imago stage from August 28th to September 28th, the last-named date being unusual. One female measuring 74 mm. in expanse is the largest I have yet bred, though another in my collection measures 72 mm. The sizes given in Tutt's "British Lepidoptera," vol. iii, p. 9, namely 46 mm. to 67·5 mm. for females would appear to be small.—B. W. ADKIN; 8, Hope Park, Bromley, Kent.

XANTHORHOË SOCIATA, AB.—I should like to record the capture, on June 7th last, on Canwock Chase, of a remarkable aberration of *Xanthorhoë (Cidaria) sociata*. The normal dark central fascia of the fore wing is wanting, the entire central portion of the wing being white except for three small black spots. The inner of these three spots corresponds in position with the normal discal spot; the other two, one above and one below it, seems to correspond with the points of the two angles in the outer edge of the normal dark band. Barrett (vol. viii, p. 103) describes a somewhat similar specimen in the late Mr. S. Webb's collection.—F. C. WOODFORDE; 19, Friar's Entry, Oxford.

EMUS HIRTUS, LINN. (COLEOPTERA).—On October 6th last E. A. G. Stowell sent me an insect which, he said, he could not properly place. As he jokingly remarked, "It looks like a cross between a grasshopper and a bumble-bee"! As a matter of fact it was an example of that scarce and curious brachelytrous beetle, *Emus hirtus*, Linn. Stowell tells me that he took it on August 21st near the sea at Studland Heath upon a sandhill bearing scattered tufts of heather and grass. It was flying, or rather "buzzing," for short distances near the ground. The day was tolerably warm as days went last August. He saw two more earlier in the day amongst heather and short bracken near the margin of the larger pond farther inland. These "buzzed" so ferociously and looked so yellow that he skipped aside, thinking he was about to step on the nest of some large wasp (or possibly hornet). They, however, flew but a yard or two and then disappeared in the heather. Later in the day he heard the same sound, and captured the "musician" instantly—the one he sent to me. He does not think it could be

obtained at will, for he spent two other days on the Heath (one much warmer) without seeing any. With the resemblance of this beetle to a humble-bee the least imaginative of naturalists is bound to be struck, and he could not help speculating on the method by which it was brought about. When we add to this fact that it has learnt to "buzz" somewhat like a humble-bee also, the problem becomes doubly fascinating. Though Stowell certainly noticed some resemblance to a rove-beetle, he did not take the creature to be coleopterous, and the fact that it could deceive so experienced a naturalist shows that the beetle's attempt at "mimicry" was a decided success. This example of *Emus hirtus* is about 22 mm. in length, while its greatest width—across the elytra—is about 8·5 mm., so that, when examined at all closely, it is seen to be proportionately more slender than a humble-bee. The groundwork of its colouring is apparently entirely black, but in great part this is disguised by a profuse clothing of long hair. This is bright golden brown on hind part of abdomen, on thorax, and on the bulky head, while on the distal two-thirds of the elytra it is grey. The rest of the animal is left densely covered with black hairs, which are interspersed with brown on antennae and legs. The formidable mandibles are black. The antennæ remind one of those of a large humble-bee.—W. J. LUCAS.

ORTHOPTERA IN R.H.S. GARDENS, 1920.—Mr. G. Fox-Wilson, F.E.S., has shown me a few Orthoptera taken during 1920 in the Royal Horticultural Society's Gardens at Wisley in Surrey. Of the Forficulodea he has only *Forficula auricularia*, Linn.: but amongst the number var. *forcipata*, Steph., occurred. *F. lesnei*, Finot, will no doubt turn up ultimately, if not *Ipterygida albipennis*, Meg., also. None of the native Blattodea had been taken, but *Periplaneta australasiae*, Fabr., *P. americana*, Linn., in the nymph and imaginal stages, and *Blatta orientalis*, Linn., had been found. The Locustodea were represented by *Leptophyes punctatissima*, Bois, *Meconema thalassinum*, De Geer, and *Metroptera brachyptera*, Linn. Of the Acridoidea there were *Tettix bipunctatus*, Linn., *Stauroderus bicolor*, Charp., *Chorthippus parallelus*, Zett., and *Gomphocerus maculatus*, Thunb. No doubt a considerable number of other species remain to be discovered, especially amongst the Locustodea and Acridoidea.—W. J. LUCAS.

HIPPARCHIA SEMELE, LINN. (LEPIDOPTERA).—As was no doubt to be expected, the wholesale felling of the Scotch firs on Esher Common, Surrey, brought about considerable changes in the ordinary vegetation of the district, but I was somewhat surprised to meet with Graylings about a hill near the Black Pond on July 29th last. I have for years visited the Common so frequently that I feel certain this butterfly was not present in the district before the felling of the timber.—W. J. LUCAS.

OBSERVATIONS ON THE LARVAL HABITS OF DIMORPHA (ENDROMIS) VERSICOLORA, L.—Mr. Morris asks me to make the following correction: *antea* p. 187, line 9 from bottom, there should be a full stop after "thus"; the next sentence will then read—"After the purge they turn pink," etc.—H. R.-B.

RECENT LITERATURE.

A Naturalist in Himalaya. By R. W. G. HINGSTON. Pp. xii + 300.
London : H. F. & G. Witherley.

FROM the fact that rather more than two-thirds of this work are devoted to entomological matters one is led to suppose that the author is primarily an entomologist; but he ranges beyond insects. All living creatures excite his interest, and from all he tries to wrest their secrets. He shows a wonderful store of patience, of careful observation, and draws his conclusions cautiously and logically, knowing full well what tricks Nature can play the unwary. And as a result he has given us a book such as few who care for the study of natural history could read and not get thoroughly interested in. The chapters on Harvesting and Carnivorous Ants and on Spiders will probably prove the best reading, as here the author seems really to have done his very best, and as a result perhaps some of the later chapters seem a trifle tame—not that they are not full of interesting facts, but rather because the author does not seem to have drawn so fully on his notes and observations.

With most of the conclusions the author arrives at one has to agree. Some are debatable certainly, but that he has tried his utmost to shed light on the psychology of instinct and on the reputed intelligence of some of the really very highly specialised forms of insect life there can be no doubt.

The work is well illustrated throughout, and succeeds in presenting a very excellent picture of life in a Himalayan valley, to which the occasional references to scenery and the concluding geological sketch contribute in no small degree.

N. D. R.

Beautiful Butterflies of the Tropics. By ARTHUR TWIDLE. Pp. x + 102, 13 plates. London : The Religious Tract Society, 1920.

THIS recent addition to entomological literature is lavishly got up on heavily-glazed paper, and is apparently designed as a guide to those whose aim in collecting exotic Lepidoptera is primarily amusement. That it is impossible to overrate the beauty of many species which, unfortunately for us, only occur in warmer climates than ours, none will deny; that there can be any justification for the capture—by means of the golden net—and exhibition of these in such a manner as to give a “restful colour effect in the arrangement,” or, by the use of “a background of green-black velvet,” to exhibit them to perfection, few would care to maintain.

However, the book may, by inspiring in some at first a desire merely to possess some of these beautiful creatures, ultimately lead them to the formation of collections from which, provided only they are fully labelled according to modern needs, it may be possible to learn something.

The volume contains many interesting notes and facts on collectors and collecting, and touches on points in connection with some species which are often forgotten. The plates are curious; the colouring of the species figured on them is accurate, but the confusion of perspectives gives some of them a most remarkable effect.

N. D. R.

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THE ENTOMOLOGICAL SOCIETY OF LONDON.

AN ANNOUNCEMENT AND AN APPEAL.

THE New Year inaugurates an epoch in the annals of the Entomological Society of London, the oldest continuous-lived Society devoted to entomology in the world except the sister Society of France, which pre-dates it by a year only, having been founded in 1833. In 1921, in February or March, our Society will hold its first meeting in premises of its own at 41, Queen's Gate, close to the Natural History Museum, and the long connection with the rooms of the Medical Society in Chandos Street, Cavendish Square, comes to an end. These rooms the Society has occupied for its meetings and for its library since November 3rd, 1875. Prior to that date the meetings had been held for some considerable time in the rooms of the Linnean Society at Burlington House, the library being accommodated in Bedford Row—an extremely inconvenient arrangement, as the then President, Sir Sidney Smith Saunders, C.M.G., pointed out when congratulating the members of the Society upon the change of venue. Already the library had become too large for the space allotted, while the facilities offered those using it were hopelessly inadequate. In this respect history repeats itself. The library has far outgrown the shelves at disposal in Chandos Street, while so great has been the increase of Fellowship that the meeting-room of late years, and even during the war period, has been insufficient to seat the augmented number of those attending. But hitherto, as stated, the Society has been no more than a tenant at will of the Medical Society, as previously of the Linnean. It will now be master in its own house, and a very fine house into the bargain. The occupation of the Chandos Street premises, moreover, has witnessed other and remarkable changes alike in the constitution of the Society and the bye-laws governing its activities. In 1885 the President, Mr. J. W. Dunning, a benefactor in many ways, appealed for the incorporation of the Society, and in July of that year a Charter was granted by warrant under the Queen's Sign Manual, and in 1913 His Majesty King George became patron. Meanwhile, from the beginning of the present century, the war notwithstanding, the roll of Fellows has steadily enlarged, until it is

clear that the Society may claim to be known not merely by its time-honoured title of the Society of London, but, should it be desired, by the title of the Society of the United Kingdom. Looking through the current list, the number of overseas Fellows elected in recent years, and drawn from the Commonwealths, Dominions, and Empire of India, is proof conclusive of the extended interest in entomology inspired and fostered by those who have given unremitting and unstinted service to this now acknowledged important branch of science. It is agreeable, therefore, to know that the Society's first sub-tenant occupying a set of rooms is the Imperial Bureau of Economic Entomology—a body supported alike by what we still call the "Colonial" Office in Whitehall and by every overseas Government within the British Empire, which happy conjunction is further emphasised by the co-operation of the College of Science, many of whose members are showing their interest in the Society in the best possible way by becoming Fellows. The acquisition of a spacious home, again, assures a central meeting-place for entomologists from all parts of the world.

A circular letter now issued by the retiring President, Commander J. J. Walker, R.N., sets out in detail particulars of the accommodation available, and it is a source of genuine pleasure to know that the magnificent library, hitherto subject in great part to all the elements of deterioration implied in congested shelves or no shelves at all, dirt and darkness, will be properly cared for and protected. The fabric itself is in good condition, and the sum, estimated at £10,000, to purchase the property and complete the necessary decorations and other alterations will not be exceeded. In the preliminary circular, issued in June, it was announced that funds would be raised by donations and by the creation of debentures at 5 per cent., secured on the property. A considerable response has already been made to the original appeal, but much remains to be done, despite the generous and satisfactory scale upon which contributions have been made. I venture, therefore, to bring to the notice of all readers of the 'Entomologist,' whether Fellows of the Society or (as I hope) intending Fellows of the Society, the financial needs of the moment. The purchase money has been subscribed, but, of course, there is still a large sum required to cover the cost of repairs to and upkeep of the building, the removal of the library and the new fittings thereof, and the furnishing of all such rooms and offices necessary to their comfort and convenience. If every Fellow helps according to his means—and there are many Fellows who will, I am sure, respond when they are in possession of the facts, either by gift or by purchase of debenture bonds—then the complete success of the venture is assured, and, further, an example afforded other Societies in less fortunate circumstances of housing, that the

enterprise of the individual is in every way superior, whether in science or in commerce, to reliance on State aid only. *Bis dat qui cito dat*: and entomologists of all branches will have reason to congratulate themselves if and when the Entomological Society of London enters upon what may be called the third epoch of its existence free of debt and financial anxiety. The increase of the annual subscription will not help the fabric fund. It will do little more, under existing conditions, than allow the Treasurer to meet satisfactorily the inflated cost of printing and publishing the Society's invaluable transactions and proceedings.

H. ROWLAND-BROWN.

Harrow Weald;
December 11th, 1920.

THE HETEROPTERA OF INDO-CHINA.

By W. L. DISTANT.

Family PENTATOMIDÆ.

Sub-Family PENTATOMINÆ.

THE present contribution to a knowledge of the Heteroptera of Indo-China is in continuation of other papers on the same subject which have already appeared in the 'Entomologist.' I am still indebted to Mon. R. Vitalis de Salvaza for the material, which I have placed in the collection of the British Museum as hitherto.

LIST OF SPECIES ALREADY RECEIVED.

Div. HALYARIA.

- Dalpada oculata*, Fabr.
" *varia*, Dall.
" *smaragdina*, Walk.
" *perelegens*, Bredd.?
" *laosana*, sp. n.
Ouscha viridissima, gen. and sp. n.
Erthesina fullo, Thunb.
Halys rugosus, sp. n.
Agæus tessellatus, Dall.
" *mimus*, Dist.
" *tonkinensis*, sp. n.

Div. DORPIARIA.

- Laprius nigritus*, sp. n.

Div. AMYNTARIA.

- Halyabbas unicolor*, Dist.
Amyntor obscurus, Dall.

Div. CARPOCORARIA.

- Niphe subjerruginea*, Westw.
" *vittativentris*, Stål.
Neoniphe armata, sp. n.
Halyomorpha picus, Fabr.
" *fletcheri*, Dist.
Tolumnia latipes, Dall., var.
" *basalis*, Dall.

Div. EUSARCOCORIARIA.

- Eusarcocoris guttiger*, Thunb.
" *rosaceus*, Dist.
Carbula crassiventris, Dall.
" *scutellata*, Dist.

Div. HOPLISTODERA.

- Alcimocoris coronatus*, Stål.
Hoplistodera tonkinensis, sp. n.
" *scutello-maculata*,
sp. n.
Sacontala rugulosa, gen. and sp. n.

Div. ANTESTARIA.

- Plautia nimbriata*, Fabr.
Antestia anchora, Thunb.
Anaca florens, Walk.
 " *pulehra*, Dall.
 " *modificata*, Dist.

Div. EURYDEMARIA.

- Agonoscelis nubila*, Fabr.
 " *femoralis*, Walk.
Eurydema pulchrum, Westw.
Stenozygum speciosum, Dall.
Strachia crucigera, Hahn.

Div. COMPASTARIA.

- Critheus lineatifrons*, Stal.
Agathocles dubius, sp. n.
Exithemus mansonicus, Bredd.?

Div. TROPICORARIA.

- Prionaea tonkinensis*, sp. n.
 " *lata*, Dall.
Placosternum taurus, Fabr.

Dalpada laosana, sp. n.

Head, pronotum and scutellum ochraceous, thickly, coarsely, blackly punctate, apical third of scutellum pale ochraceous, the punctures concolorous: membrane bronzy-black: antennae black, bases of fourth and fifth joints creamy-white: body beneath and legs ochraceous, lateral margins of head and pronotum (broadly), sublateral marginal fasciae to abdomen—meeting margins at junction of segments—two large spots between pro- and meso-coxae, two large spots on second abdominal segment, and a central spot on penultimate segment, shining black: rostrum just passing the first abdominal segment.

Long. 19 mm.; breadth between pronotal angles. 10 mm.
 Laos, Luang Prabang.

ORSCHA, gen. nov.

Body elongately ovate: head considerably longer than broad, the lateral lobes longer than the central lobe and slightly upturned and divergent, a strong spinous angulation on each lateral margin before the insertion of the antennae and a smaller spine on each side before eyes, antennae 5-jointed, basal joint not reaching apex of head, second and third about subequal in length and shorter than fourth and fifth, eyes globose and prominent; rostrum about passing the bases of the posterior coxae, lateral margins of the pronotum crenulated, the lateral angles shortly, robustly prominent; membrane with about six prominent longitudinal veins; tibiae furrowed beneath on apical areas, the anterior tibiae somewhat broadened near apices, where they are sulcated beneath.

Allied to *Apodiphus*.

Div. RHYNCHOCORARIA.

- Rhynchoscoris humeralis*, Thunb.
Epagathus chapana, gen. and
sp. n.

Div. NEZARIA.

- Neojurtina typica*, gen. and
sp. n.
Catacanthus incarnatus, Dru.
Nezara viridula, Linn.

Div. MENIDARIA.

- Menida laosana*, sp. n.
 " *raja*, sp. n.
 " *vitalisana*, sp. n.
 " *salvazana*, sp. n.
Udonga spiridens, gen. and
sp. n.

- Patereulus aberrans*, sp. n.
 " *affinis*, Dist.

Ouscha viridissima.

Above metallic-green, coarsely, thickly punctate, narrow anterior and lateral margins to head, eyes, lateral margins and apices of lateral angles to pronotum, body beneath and legs ochraceous; head, pronotum and scutellum thickly, coarsely punctate, corium more thickly and finely punctate; antennæ ochraceous, apex of third and about apical halves of fourth and fifth joints black; head apically broadly excavate between the lateral lobes; legs ochraceous, femora finely sprinkled with minute darker spots, lateral margins of the body beneath more or less suffused with metallic green; membrane pale brownish, slightly passing the abdominal apex.

Long, 17 to 18½ mm.; breadth between pronotal angles, 7½ mm.
Tonkin; Chapa. Laos; Xieng Khonang.

Halys ruyosus, sp. n.

Body above thickly and very coarsely punctate, pale ochraceous, the punctures black or dark ochraceous; head elongate, tapering in front, the central lobe longer than the lateral lobes, blackly punctate, especially on central lobe and near eyes; antennæ ochraceous, the first, fourth and fifth joints darker, sometimes almost black, second joint a little shorter than third, fourth or fifth joints; eyes fuliginous; pronotum coarsely punctate, the lateral margins shortly dentate, the lateral angles shortly and broadly prominent and their apices broadly, distinctly upturned; scutellum coarsely blackly punctate, the lateral angle and apical area distinctly paler but coarsely punctate; corium blackly punctate, the punctures coalescing on disc and forming three irregularly-shaped spots; membrane dark bronzy-brown; body beneath and legs ochraceous; punctures to femora, basal and apical areas of tibiæ and apices of tarsi black; head beneath thickly, darkly, coarsely punctate, sternum laterally broadly, thickly darkly punctate, mesosternum with two contiguous, central, shining black spots, abdomen with the segmental margins and a subapical spot black, the lateral margins black with large ochraceous segmental spots; abdomen centrally longitudinally sulcate, rostrum reaching the third abdominal segment.

Long, 16–18 mm.; breadth between pronotal angles, 8½–9 mm.
Laos, Xieng Khonang, Giranville; Haut Mekong, Vieng Vai.

Agaeus tonkinensis, sp. n.

Above ochraceous; head with a broad longitudinal black fascia broadened from between eyes and containing a central longitudinal ochraceous line; pronotum with two transverse elongate spots behind anterior margin, two large rounded central spots on disc which nearly reach posterior margin, and two small oblique submarginal spots situate just above lateral angles, black; scutellum with the basal area dark greenish-black, beyond which the sublateral margins are of the same colour; corium with a broad central transverse fascia and a rounded spot both near base and apex, black; membrane bronzy-black; body beneath ochraceous with bluish-black maculations both centrally and laterally; rostrum bluish-black,

ochraceous at base and extending to third abdominal segment; antennae black, first joint slightly passing apex of head, second, third and fourth joints longest and almost subequal in length; body above thickly and somewhat coarsely punctate.

Long, 19 mm.

Tonkin; Chapa.

Laprius nigritus, sp. n.

Head black, ocelli red, eyes brownish-ochraceous; pronotum and scutellum dark castaneous, almost black; corium a little paler and more castaneous; membrane dark greyish; body beneath and legs black; rostrum very dark castaneous, basal joint ochraceous; antennae mutilated in type, but first and second joints dark ochraceous, basal joint annulated with black near apex, first joint not reaching apex of head; head, pronotum and scutellum thickly, very coarsely punctate, corium thickly but more finely punctate; body beneath thickly, very finely punctate; rostrum very slightly passing the posterior coxa; antenniferous tubercles with a small spine at base.

Long, 11 mm.; breadth between pronotal angles, $5\frac{1}{2}$ mm.

Laos: Xieng Khonang.

(To be continued.)

CONTRIBUTIONS TO OUR KNOWLEDGE OF THE
BRITISH BRACONIDÆ.

By G. T. LYLE, F.E.S.

(Continued from vol. liii, p. 250.)

Described from two males and two females in the Dale Collection at Oxford and a pair in the Cambridge University Museum. Considering these are all old pinned specimens they are in fairly good condition though all are more or less damaged. The Cambridge specimens and two of those at Oxford are without data; the remaining Oxford examples bear locality labels, but Dale's writing thereon is almost indecipherable; one has the date 1899 with some hieroglyphs and the other appears to read "ex *Polycommata*." All Dale's specimens were named by him *Microdus rugulosus*, Nees: that species, however, has a length of only $3\frac{1}{2}$ mm. and the terebra as long as abdomen and thorax, besides differing in other respects.

Earinus tuberculatus, Wesm.*

Very similar to *delusor*, but differing in that the radius has a double curve and the tubercles of the first abdominal segment are very prominent, etc. Wesmael's description is as follows:

"Niger, pedibus rufis, coxis, trochanterum articulo primo,

* "Nouv. Mem. Acad. Sc. Belg.", vol. x, p. 13.

tarsisque postieis nigris; tibiis postieis albidis, macula ante basin apicique fuscis; primi segmenti abdominis tuberculis lateralibus acute prominulis (coxis posterioribus rufis; terebra corpore paulo breviore, ♀).

The terebra is very slightly shorter than abdomen and thorax combined; the hind coxae are rufous in the female but black in the male; wings hyaline at base, darker towards apex. Antennæ 30–31-jointed. In some examples the nervure dividing the first cubital and first discoidal cells, though always traceable, is indistinct, which adds to the structural resemblance the species bears to *Microdus tumidulus*; there can be no doubt, however, that it is a true *Earinus*, the mesothoracic sutures being almost indiscernible.

Not before recorded as British and possibly hitherto confused with *delusor* (*gloriatorius*, Marsh.). I have found it fairly common in the New Forest, where on dull, damp days in April and early May I have on many occasions beaten both sexes from the leafless, lichen-covered branches of oak trees.

GENUS 5. *Orgilus*, Hal.*

Authors have taken somewhat divergent views as to the true position of this aberrant genus, and although the majority consider it rightly placed with the *Agathidæ*, there is no doubt that considerable affinity is shown to the *Macrocentridæ*, as noted by Haliday, and also to the genera *Eubadizon* and *Pygostolus*. I am rather inclined to agree with Ashmead,[†] who based his *Orgilini*, a tribe of his *Blacinae*, on the genus, placing it immediately before *Eubadizon*. Szépligeti[‡] did not agree with the American classification and restored the genus to its old position.

Maxillary palpi 6-, labial 4-jointed. Face ordinary; mesopleurae with a crenulate furrow; mesothorax distinctly trilobed. Wings short, narrow, stigma somewhat elongate, two cubital cells, the first distinct from the first discoidal; radial cell narrow, though much larger than in the preceding genera, ending much before apex of wing; first intercubital nervure almost in a line with the second (third) abscissa of radius.

TABLE OF SPECIES.

Wings normal; terebra as long as body	<i>obscurator</i> , Nees.
Wings narrow; terebra rather longer than abdomen	<i>ischnus</i> , Marsh.

Orgilus obscurator, Nees. §

A robust black insect with infumated wings and the legs

* 'Ent. Mag.', vol. iii, p. 123.

† 'Proc. U.S. Nat. Mus.', vol. xxiii, p. 122.

‡ 'Gen. Ins. (Braconidæ)', p. 119.

§ 'Mon.', vol. i, p. 151.

more or less rufescent, and occasionally the second abdominal segment rufous at the sides. *Terebra* as long as the body. Varies very considerably in size; I have seen males with a length of 5 mm. and others no more than 3 mm.

Seven females and one male, all without data, are in Dale's Collection, and one male and three females in the Hope Museum Collection. Cambridge University Museum possesses a single female taken by C. G. Lamb at St. Merryn, June, 1916. Harwood has a fine pair, the male bred from a Colchester larva of *Retinia buolianana*, July 8th, 1914, and the female from the same host at Wivenhoe, August, 1910. I have taken it at the Fleam Dyke, Cambridge, and also in the New Forest in August.

Orgilus ischnus, Marsh.

Described by Marshall from specimens taken by Bridgman. One labelled "type" is in the British Museum. In this example the abdomen is longer and wings smaller and narrower than in *obscurator*. Antennæ 32-jointed in both sexes; *terebra* rather longer than abdomen.

I have never met with the species myself, nor is it represented in any of the collections to which I have had access with the exception of the single specimen mentioned above.

SOME NOTES ON THE COLLECTION OF BRITISH
MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT
OF THE OXFORD UNIVERSITY MUSEUM.

By F. C. WOODFORDE, B.A., F.E.S.

(Continued from vol. liii, p. 259.)

LYMANTRIIDAE.

Laelia cornosa.—Series of 35 from various collections. One female from the Meldola is labelled "Burwell Fen. Dr. W. Horley."

Ocneria dispar.—A long series from the Hope and Spilsbury and more modern collections, some of them apparently of great age. Three males from the Spilsbury Collection have the inner and central portions of the fore wing nearly filled with whitish, with a dark narrow band along the outer margin. A small, seemingly very old male has all the wings of a dingy white.

Lymantria monacha.—A series of 6, bred by Mr. C. Rippon from New Forest parents, have the abdomen banded with pale yellow instead of the normal pink. The fore wings are suffused with black to an abnormal extent.

* *Spec. Hym. Eur.*, vol. v bis, p. 197.

LASIOCAMPIDÆ.

Pachygastria trifolii.—Two specimens from the Hope Collection came from F. Bond's Collection. They were bred in August, 1871, from larvæ taken in Romney Marsh, Kent. They are described in the 'Proceedings of the Entomological Society,' November 20th, 1871. They are very pale brown on the inner portion of the fore wings, the outer portion being ochreous.

Lasiocampa quercus.—A very remarkable specimen from the Hope Collection, which has the body and wings of a female with male antennæ, also came from F. Bond. It is labelled "May, 1867, larva found in the London District." On another label is "Mr. F. Bond."

Macrothylacia rubi.—In a male specimen from the Hope Collection the two pale lines are widened and drawn close together, making a pale band, only showing indications of the dark inner band at the costa and inner margin. In two other specimens taken by myself in North Staffs by assembling, and in one from the Meldola Collection from Morpeth, the two pale lines are much nearer to each other than is normal. In two others, one bred by myself from a New Forest larva, the other from the Chitty Collection, also from the New Forest, the inner pale line is obsolete.

Gastropacha ilicifolia.—Two specimens from the Spilsbury Collection without data. One from the Sellon Collection, labelled "Cannock Chase by Orgill of Rugeley." It is rather faded and the antennæ are wanting, but is otherwise in very fair condition.

DREPANIDÆ.

Drepana falcataria.—Five ab. *pallida*, White.

D. harpagula = *sicula*.—Six specimens, four presented by Mr. G. C. Griffiths, bred by him from larvæ beaten in the Leigh Woods, Bristol, 1895, 1896 and 1899. One from the Meldola Collection, labelled "Leigh Woods, Bristol bred 6. 1899." One from the Sellon Collection, without data.

D. lacertinaria.—Several ab. *scincula*, one of them from the Hope Collection being a Haworth specimen and labelled by him "*scincula*."

NOLIDÆ.

Nola strigula.—Six from the Sellon Collection, New Forest; 5 from the Meldola Collection; 4 from Sussex, Abbot's Wood; 1 Kent, Darenth Wood; 1 from the Pogson Smith Collection, labelled "Oxford district, July 1897."

N. confusalis.—Two specimens of ab. *columbina*, Selwyn Image, from Epping Forest. One of them is one of the two specimens exhibited at a meeting of the Entomological Society, June

6th, 1906, and reported in the 'Proceedings of the Entomological Society' of the same date. The other is from the Meldola Collection, taken in Epping Forest, May 30th, 1908. This variety was first described in the 'Entomological Record,' vol. xvii, p. 188.

N. albularis.—Long series, but only eight specimens with data. These are from the Meldola Collection, labelled "Kent. Chattenden," without date.

N. centonalis.—Eight specimens. One from the Meldola Collection, labelled "Deal. 1881 3. Rt. Adkin." One specimen in each series of *N. ceculatella*, *strigula* and *confusalis* are Haworth specimens, and each is labelled with its name in his writing.

N.B.—Haworth's specimens are recognisable by a special label.

SARROTHRIPINÆ.

Sarrothripa revayana.—Series of over 100, including almost every possible variation. By far the greater number are from the New Forest. By the kindness of Mr. South several of the forms have been identified and named.

ARCTIIDÆ.

Spilosoma menthastris.—In a long series from Perthshire, bred and presented by Mr. T. M. Marshall, the fore wings are of varying shades of pale buff. From the Meldola Collection is a very dark buff form from Glasgow. A female from North Staffs, bred by myself last year, is asymmetric, the right fore wing having less than half the number of spots that there are on the left. The right hind wing has only one very small submarginal spot, while the left has two. In both hind wings the central spot is obsolete. From the Hope Collection is one of Haworth's specimens, labelled by him *S. lubricipeda*. The series contains 14 ab. *radiata* and 9 ab. *zatima*.

Diaphora mendica.—Six specimens bred by Mr. L. W. Newman are six hybrids, between the type and ab. *rustica*. The males are pale greyish-buff. In a series of 16 bred from ova obtained by me from Mr. L. W. Newman in 1916, together with the two parents, the males, except one, which is rather pale buff, are of true *rustica* type. From two of this brood another generation of 17 specimens was reared. The male parent was of the true *rustica* type, but 3 of the male offspring resembled the hybrid males alluded to above, the 6 other males being true *rustica*.

Phragmatobia fuliginosa.—In 3 females from the Champion Collection, bred from larvae taken near Woking, and a female from the Meldola Collection, taken in North Cornwall, the fore wings are dark and the hind wings show only a very narrow red border along the inner margin, and closely resemble var. *borealis*.

A series of 6 var. *borealis* from Aberdeenshire was presented by Mr. A. Horne.

Parasemia plantaginis.—In a striking series of 18, taken wild near Cerne Abbas, Dorset, by Dr. R. C. L. Perkin, and presented by him, the paler markings predominate over the black. This is particularly noticeable in the females, five of which have remarkably small proportion of black in the fore wings. A specimen from the Sellon Collection has a female body and markings, but the right antenna is female and the right male. It is labelled "Hermaphrodite (Harwood)."

Diacrisia sanio.—A male taken in N. Staffs by myself in 1917 is almost entirely wanting in the black border of the hind wings, this being slightly indicated by a few greyish scales. A female taken in the same locality has almost the whole of the hind wing filled with black, only two small rufous spots being left.

Arctia caia.—A long series showing a great deal of minor variation. There is one very remarkable aberration of a female from the Spilsbury Collection. Except for a few very small white spots which do not correspond with each other on each side the whole of the forewings are filled up with very dark brown. On this dark brown ground are black markings exactly corresponding with the usual white markings of a normal specimen. The hind wings have a very broad blue-black border, with a broad dark central band. From the Hope Collection is a female with normal markings, but with lemon-coloured hind wings.

Callimorpha dominula.—One from the Chitty Collection taken in S. Devon has the two spots near the anal angle of the hind wings coalescent, with much blackish suffusion towards the centre of the wing, resembling a smudged ink-blot. A series of 10 fine bred ab. *rossica* from Kentish stock (from L. W. Newman).

Coscinia striata.—Two specimens, both from the Hope Collection. One of them has a label "Wells Brit. Coll." Neither of them is in perfect condition.

C. cibrum.—Varied series of over 60, mostly from Ringwood. Six from the Meldola Collection, labelled "Canford, Dorset."

Deiopeia pulchella.—Six specimens. One from the Sellon Collection, on an old common pin, labelled "Standen's Collection"; another label, apparently Standen's, has on it "Taken by Dr. Battersby at Torquay." A second from the Sellon Collection has a label "Folkestone, -'84 taken by V. R. Prince." Two from the Spilsbury Collection, one labelled "from Mr. Brockhoules' Collection, Westmoreland, bred by the Revd. — Tristram. ♀ caught at Torquay, which laid 14 eggs. From Mr. Hodgkinson." Two from the Hope Collection with no data.

Hipocrita jacobææ.—Two specimens have yellow hind wings and a yellow stripe and spots on the fore wing. One is from the Hope Collection. The other from near Southampton, taken about 1889 by the Rev. G. Hughes.

Cybosia mesomella.—A male and two females from the Hope Collection are Haworth specimens. The male has yellow fore wings, and is labelled by him "eborina." One of the females is labelled, also by him, "flavescens."

Lithosia deplana.—A fairly long series with considerable variation. A very large female from the Sellon Collection, taken in the New Forest, and another from the Meldola Collection taken at Horley, Surrey, have very dark greyish-brown fore wings with a strong dark yellow stripe along the costa extending to the apex, the hind wings being darkish grey. Two females from the Meldola Collection taken at Boxhill have rather bright yellow forewings (resembling pale specimens of *L. sororecula*) with paler hind wings. From the Hope Collection is a Haworth specimen labelled by him "helvola."

L. griseola.—A Haworth specimen is labelled by him "ochreola."

L. griseola, ab. *flava*.—There are two Haworth specimens, one of which is labelled by him "flava, F."

Lithosia sericea.—Six specimens from Warrington. Four others from Chitty and Sellon Collections, unlabelled.

L. caniola.—A long series from S. Devon. One pure white = ab. *lacteola*, Boisd., a female, was taken by myself last August near Paignton. From the Meldola Collection are three specimens labelled "Romney Marsh 1895."

Lithosia sororina.—A Haworth specimen labelled by him "Aurantina, Pr."

Pelosia muscerda.—Two of the specimens from the Meldola Collection are labelled, one "Eastry, Kent, 1903," the other "Kent 1907."

(To be continued.)

NOTES ON THE VARIATION OF *PERONEA CRISTANA*, FAB., WITH DESCRIPTIONS OF SIX NEW FORMS, AND THE REASONS FOR SINKING THE NAMES AT PRESENT IN USE OF SIX OTHERS.

By W. G. SHELDON, F.Z.S., F.E.S.

(Continued from vol. liii, p. 271.)

Ab. *lichenana*, Curtis. Webb writes of this (*loc. cit.*, vol. xliv, p. 309) : "May perhaps be identical with *subvittata*, Stephs." This is another case of not looking at the original description.

Curtis describes *lichenana* as having a *dark* button, whereas *subrittana* has a *cream-coloured*, or, as Stephens says, a whitish one.

Ab. *ruficostana*, Curtis. Webb (*loc. cit.*, vol. xliii, p. 368) criticises Clark for creating a new name for the white vitta form of this group thus : "Curtis says of the type of *ruficostana*, 'inner margin white,' but Clark, that the true *ruficostana* is yellow." Which is correct? If Curtis stands, *alboruficostana*, Clark, must fall, but for many years that with the white vitta has been in our cabinets as the typical form; the description must stand before any plate."

This is one of the least logical statements in the whole paper and should be wiped out from memory. Curtis, in 'British Entomology,' first edition (1824), plate 16, figures the yellow vitta form as *ruficostana*. There can be no doubt about this: the figure is a very beautiful one, and the vitta is lemon-yellow. In his description, however, No. 24, he says: "Inner margin (= vitta) white." It is to be presumed that he figured a yellow vitta example, and described one with a white vitta, overlooking the discrepancy. There may be something of weight in suggesting that when the average author describes a feature as white it should stand before his figure which makes it yellow, but in the case of Curtis it is different. The average author in writing on Lepidoptera gets an artist to produce his plates, whereas he writes his own descriptions, and thus an error is more likely to occur in the former than in the latter. But Curtis was his own artist, and whilst his figures are the finest that have ever been produced in any entomological book in Britain, so exquisitely executed that there can be very little doubt as to the particular species he intended to represent in any one of them, the same excellence does not apply to his descriptions, which are in many cases only outlined. Unquestionably a figure that proceeded from him should stand before any of his descriptions when the two diverge. There is the additional objection to Webb's suggestion, that its adoption would leave the form with a yellow vitta without a name, and a new one would have to be found for it. His remark that the form with the white vitta is the one that has been in our cabinets for many years as the type is no doubt correct, but that is not a reason why the error should be perpetuated.

Ab. *ruficostana*, Curtis (with the yellow vitta), is by far the rarest form of the two. Out of several thousand examples of *cristana* forms examined in the five years I have studied the species, I have only come across one specimen, which came from the New Forest, whereas of the forms with the white vitta I have picked out about thirty. Mr. South has two examples of *ruficostana* from the New Forest.

The descriptions of Desvignes constitute one of the chief difficulties experienced by students of the variation of *cristana*;

they are the veriest outlines, in some cases consisting of less than half a dozen words, but they usually enumerate the differences of the form described from some other previously known form, and I find that by looking up the descriptions of these latter and studying them carefully one can understand Desvignes' meaning.

The investigation has, however, its difficulties. Desvignes was only acquainted with a comparatively few forms, or, as he considered several of them, species, and as since his day many other forms somewhat similar to those he described have been named—one suspects without understanding what his forms actually were—and others known to him are no longer found, it is sometimes difficult to understand him. Unfortunately his very large collection of the *Peroneas* has disappeared, and the whereabouts of the specimens, if they exist, is not known.*

I have devoted a good deal of time to studying his meaning, and I think, thanks largely to the Webb specimens, I have succeeded in elucidating it. The forms which have hitherto appeared to me not understandable are the following: (1) *unicolorana*, (2) *xanthorittana*, (3) *curtisana*, (4) *tolana*, (5) *proritana*.

To take these in the order as given :

(1) Ab. *unicolorana*. Desvignes writes of this: "Its colour being uniform dark GREEN." It seems evident that for the word "green" should be substituted the word "brown," because apart from the question that a green form of *cristana* is not only not known and is quite outside the colour variation of even this protean species, Desvignes goes on to write of the next aberration, *alboflammana*: "Similar to the preceding, with a white dash on the inner margin." Now *alboflammana* is one of Curtis's names, and his description of it is: "Superior wings livid brown, with a small button on the disc." This of course settles definitely the doubtful point.

(2) *Xanthorittana*. Desvignes says of this: "Similar (to *alboflammana*), with a yellow or fulvous dash; palpi, head and thorax of the same colour." To this description one must of course add that of Curtis's of *alboflammana* given above, and we then find that *xanthorittana* is a form with livid brown wings, a small button on the disc, and a yellow or fulvous vitta, palpi, head and thorax. This description exactly agrees with Clark's ab. *procyanthorittana*, which must fall before Desvignes' name. Clark, of course, was under the impression that *xanthovittana* had a large button.

* Since writing the above I find in E.M.M., vol. v, p. 26 (1868), it is stated that Desvignes's Collection of British insects will shortly be sold at Stevens's, and in the same volume, p. 180, that "S. Stevens exhibited at a meeting of the Entomological Society of London a Geometrid from Desvignes's cabinet." It would appear most probable that his *cristana* were included in this sale, that they were then distributed amongst the buyers of that species, and that a number of them would find their way eventually into the Webb series.

(3) *Curtisana*. I have already given the reasons why I consider ab. *charlottana*, Clark, should fall before this.

(4) *Tolana*. The identity of this form has puzzled many students of *cristana*, including Clark and Mason, neither of whom knew it; but there can be no reasonable doubt but that Webb's definition of it (*loc. cit.*, vol. xliii, p. 199) is the correct one.

(5) *Provittana*. This aberration seems to be very imperfectly understood. Webb in his paper (*loc. cit.*, xliv, p. 291) does not attempt to define it, but the series of examples so labelled in his collection do not agree with Desvignes' description, and are very near to *fulcostriana*, Dsvgs.

The form that usually passes muster in our collections for *provittana* is a rusty insect in every way resembling *seminotana*, Curt., but with a cream-coloured vitta, head and thorax, but this again does not agree with the original description by Desvignes, who says: "Peronea *profanana*. Var. 1, *profanana*, Fab., cinereous, with tufts of scales of the same colour. Var. 2, *provittana*, Des., similar, with a yellow dash." To realise what *provittana* is we must first find out what *profanana*, Fab. is, and what Desvignes thought it was. Fabricius's description is as quoted by Desvignes: "Alis cinereis; puncto medio fusco." Now what does Fabricius mean by "cinereis"? One would think ash-coloured, or gray without any tinge of brown; but if one turns to 'Ent. Syst.' and runs through it, and especially through the descriptions of the Pyrales, Crambites and Tortrices, which were written approximately at the date on which he wrote that of *profanana*, one finds quite a number of species in which this word is used, some of which are pure grey, but others are distinctly tinged with brown—for instance, *Crambus pratellus*, *C. pascuellus*, *Z. grisealis*, *A. pinguinalis*, and *T. crataegana*.

Turning next to the figures of *profanana*, and the descriptions of it, at the date that Desvignes wrote (1845), one finds in Wood, 'Index Entomologicus,' fig. 1047 (1839), a distinctly brown insect, it is moreover both in this work and in Westwood a few years later, named the "rusty button." Stephens ('Haust.' vol. iv, p. 149, (1834), speaks of it as rusty griseous. Wood's figure (*loc. cit.*) shows a dark base, costal blotch, and apex; and Stephens (*loc. cit.*), alludes to these dark markings, and there can be little doubt but that when these authors' works appeared these were held to be the characteristics of ab. *profanana*. These dark cloudings are not mentioned by Fabricius, and therefore they should not apply to the type, but I think we must consider what was in Desvignes' mind when he named ab. *provittana*, and there can be but little doubt that he saw a form with these darker blotches.

It is evident that in translating "cinereis" we must use a considerable amount of latitude and include anything that is grey or greyish brown, and so *provittana* becomes, I take it, a form with greyish-brown superiors, blotched with darker brown and

with a yellow vitta. There are in Webb's series about half a score examples which answer to this description; most of them were included by him amongst those he had labelled *nigropunctana*, Clark. They are all old specimens, without data, with the exception of one, which has Webb's label attached to the pin, " *xanthorittana*, Clark. " !

The latitude which I suggest should be given to the ground *profanana* would, I think, rule out ab. *sepiana*, Sheldon, which name should be discontinued.

Ab. *sequana*, Curtis. This form requires eliminating from the lists. In 1834 Duponchel figured in 'Hist. Nat.', pl. 244, fig. 2, a *Peronea*, which in vol. ix, p. 157, he describes as *P. combustana*, and gives as its synonyms *T. combustana*, Hüb., *T. byringera*, Hüb., *T. sparsana*, W. V., *T. hastiana*, Frol., *Peronea combustana*, Stphs., and *P. byringera* Stephs.; but these are all a form of *P. hastiana*, L.! *Combustana*, Hüb. (Fig. 234), has a very striking superficial resemblance to Duponchel's figure, which is, however, obviously a form of *cristana*, with a well-developed button. As a matter of fact it is identical with the form Curtis (after 1834) named *sequana*, which therefore must fall before it.

There cannot be any doubt about the identity of these forms. The figure, like most of Duponchel's, is an extremely good one, it portrays an average ab. *sequana* in every respect, except that the button is slightly paler in tint, but I have examples with the button exactly of the colour of Duponchel's figure; he was, no doubt, led into the error of mistaking one species for another by the superficial similarity of his specimen to Hübner's figure.

(To be continued.)

NOTES AND OBSERVATIONS.

AGRIADES CORYDON AB. SEMI-SYGRAPHIA IN SUSSEX.—Seeing Mr. Oliver's note on *A. corydon* ('Entom.', vol. liii, p. 283) reminds me that during the past season *A. corydon* has disappeared from a spot on the South Downs, near Ditchling, Sussex, which in 1919 was such a prolific colony that it was really difficult to net single specimens without taking others at the same time. I do not think that I missed the season for this insect, for I visited the spot almost weekly from late June to late August, being rewarded by one very poor female on August 14th. Last year ab. *semi-sygrapha* was taken here by my friend, F. Wood, and we both noticed other specimens, though the full var. *sygrapha* was apparently not in evidence.—STANLEY N. A. JACOBS: 5, Exbury Road, Catford Hill, London, S.E. 6.

CHrysophanus dispar, Haw.—Mr. N. D. Riley ('Entom.', vol. liii, p. 10, 1920), in his note on the "so-called Dutch" *C. dispar*, differentiates this form from our extinct fennoscandian type form. It is, therefore, of considerable interest to British collectors to observe that M. Charles

Oberthür, whose authority is unquestioned, takes a different view, and identifies the Dutch with the British "Large Copper." Writing in the ' Bulletin de la Soc. Ent. de France' (1920, No. 15, pp. 254-5) he says: "Finally, the *C. dispar*, conforming absolutely to the extinct English race, has been discovered in Holland. I have been able to compare a superb Dutch male, for which I am indebted to the courtesy of M. Van Eecke, of the Leyden Museum, with old English examples included in my collection. It appears to me impossible to determine any difference between the Dutch and English *C. dispar*." I may add that in the fine collection which was left me by the late Rev. F. E. Lowe, of Guernsey, there are five magnificent specimens of *C. dispar*, which came into his possession from the Mason Collection—three males and two females.—H. ROWLAND-BROWN; Harrow Weald, December 11th, 1920.

CURIOS LATE EMERGENCE OF PAPILIO ALEXANOR.—We have had a very wet and stormy autumn, and to my surprise during an awfully cold week of east wind a fine *P. alexanor* emerged in the garage on the north side of the house on November 1st, I cannot say if from this season's pupæ or last, as some which did not hatch of last year's still remain spun up with those of this year. It struck me as extraordinary in such cold weather.—C. E. MORRIS; Villa Chatelet, Le Cannet, Alpes-Maritimes, November 1st, 1920.

[Is it possible that *P. alexanor*, a single-brooded species in south-east France, and I believe generally, sometimes attempts a second emergence after the fashion of *P. machaon*, the only other double-brooded species of this Swallow-tail group in the western palæarctic region?—H. R.-B.]

CHRYSOPHANUS PHLÆAS, L., VAR., OR AB. C.ERULEO-PUNCTATA.—This species is, in its typical state, common in my garden and grounds, particularly affecting a large herbaceous border in the kitchen garden, which slopes towards the south-east, and is bordered on that side by the Rea Brook, a tributary of the Severn, its banks margined with thick growth of reed-mace and many other moisture-loving plants. Beyond stretch water-meadows, often inundated. It is only in the above-mentioned herbaceous border I have found the blue-spotted form, and very fine, well marked and large some of the examples are. Such fly about, often sporting in a somewhat pugnacious manner with typical specimens. My experience therefore tallies with that of Mr. S. Jacobs ('Entom.', vol. liii, p. 233) and Mr. W. Pierce (*ibid.*, p. 285). May I be allowed to express the hope that a good proportion of the 537 mentioned as having been captured by the former gentleman were allowed their freedom after having been examined, and were not immolated on the altar of critical research, as there can be no doubt that in some places the Lepidoptera—and more particularly the Diurni—are being over-collected, and consequent dearth, if not absolute extinction, is sure to follow in the long run.—J. COSMO MELVILL; Meole-Brace Hall, Salop.

BRENTHIS (ARGYNNIS) SELENE, SECOND BROOD AT ABBOTT'S WOOD.—When visiting these woods on August 8th with my friend Mr. E. P. Sharp, of Eastbourne, we found *A. selene* flying in considerable

numbers, and had no difficulty in selecting some sixty specimens in a couple of hours in the morning. This brood was apparently confined to one large rough field, as in the afternoon we explored other parts of the woods where the spring brood has been abundant without seeing a single *scène*. On the 11th there seemed to be a still greater number on the wing. On neither occasion did I notice any varieties, but I believe some were taken subsequently by local collector's. Mr. Sharp tells me that the spring brood was out in great numbers between May 23rd and June 6th. It seems possible that as June and July were cold and wet the vegetation would receive no check to its growth as in hot and dry summers, when previous second broods have been recorded, and this may account for the large number of this 1920 August emergence. Looking back through various magazines I can only find records of one or two at a time, except in 1911, when 30 were recorded from Ilfracombe.—H. WORSLEY WOOD; 31, Agate Road, Hammersmith.

COLIAS EDUSA AND *ab. HELICE*.—The experience of friends of myself in this district this season with these insects may be of interest. On August 8th, after an absence of three years, I first saw *edusa* at Halland, near Uckfield, Sussex, and later in this district I saw about twelve, of which I secured three good specimens, one ♀. On returning to Brighton on August 13th I renewed my search, and from that date to the end of September I saw altogether about thirty-six, of which I secured twenty. On September 5th I obtained three worn ♀, and decided to see if ova were produced, and during the next fortnight I was successful in obtaining a goodly number, but many were not fertile. Altogether about three dozen hatched, of which I retained one-third and gave the others to friends. From October 20th nine pupated, and at the present time of the whole number sixteen have emerged, the first on November 11th, one being *ab. helice*, and the last yesterday, a ♀. I still have three pupae which are changing and should emerge this week. At first the larvae were fed on *M. sativa*, but later the food was changed to *L. corniculatus*, which they took more readily to. Friends of mine saw many *edusa* in this district during August and September, one securing so many as nine dozen. Altogether, including the one referred to, there have been eleven *ab. helice* taken this season in the neighbourhood of Brighton. LOUIS MEADEN; Melbourne, Dyke Road, Preston, Brighton, November 19th, 1920.

[Since sending the above note, Mr. Meaden reports two other specimens of *helice* reared by friends from larvae he had given to them.—Ed.]

COLIAS EDUSA, *PYRAMEIS ATALANTA* AND *AGLAIS URTICÆ* IN CAMBRIDGESHIRE, GUERNSEY, AND NORTHERN FRANCE.—The following notes may have some interest in connection with those which have recently appeared in the 'Entomologist.' The only *Colias* that I have seen in England this year was one specimen of *C. edusa* flying beside the Newmarket Road, about four miles from Cambridge, on August 26th. Inquiries made of several naturalist friends have not produced any other evidence of this butterfly being seen in the district this season. Mr. Michael G. L. Perkins tells me that it was abun-

dant in Guernsey during August and September, but that he cannot recall having seen any *helice* or *hyale* there. From September 3rd to 15th I was in Normandy, in the wooded country on the right (north) bank of the Seine. But though the weather from September 7th onwards was very fine no great profusion of *C. edusa* was observed. During that time about a dozen specimens in all were counted at several places between Lillebonne and Rouen. No *helice* or *hyale* were seen. Cambridge shared, at any rate moderately, in the general abundance of *P. atlanta* this season. The well-known attractiveness of the flowers of *Buddleia* to this butterfly was strikingly demonstrated on August 15th in the Botanic Garden, when two large *Buddleia* bushes, more than a hundred yards apart, where entertaining altogether ten or twelve *atlanta*, as well as several *Vanessa io* and *Pieris brassicæ*, but no *atlanta* or *io* were to be seen anywhere else in the garden, though this is of considerable extent, and was then very flowery. *P. atlanta* was plentiful in France during my stay. The flowers of *Eupatorium* (Hemp Agrimony), which was very abundant in places, seemed to be specially attractive to these insects. About September 9th fresh-looking specimens were seen, six to a dozen together, settling on great clumps of this plant beside the road along the bank of the Seine near Caudebec-en-Caux. Subsequently, between September 19th and 23rd, single specimens were noticed in the heart of Paris, flying over the flowers in the Jardin des Plantes and the Luxembourg Gardens. *Aglais urticæ* is only mentioned to chronicle a rather late appearance. One of these butterflies was flying rather feebly, and sunning itself on stones, in the Cambridge Botanic Garden on October 24th. No other butterflies were in evidence, but on ivy-blossom near by were numbers of wasps and bluebottles, and a large queen *Bombus* having the *terrestris*-type of colouring.—HUGH SCOTT; University Museum of Zoology, Cambridge.

TRIGONOPHORA FLAMMEA IN SUSSEX.—Last week I received a specimen of *Trigonophora flammea* from Chailey, Sussex. Beyond being slightly faded it is in good condition, even to legs and antennæ. It was found hanging in a cobweb in a loft, and by its faded colouring I should say it had been there since last year. Fortunately the web was untenanted by any spider, nor had the bats which frequent the loft touched it. It has relaxed and set quite well.—STANLEY N. A. JACOBS; 5, Exbury Road, Catford Hill, London, S.E. 6.

NOTES FROM CHINNOR, OXFORD.—I am glad to report the capture of *Thecla pruni* and *Limenitis sibylla* in a new locality, a collector having brought me fifteen of the former and four of the latter that he had taken. No doubt Mr. Rowland-Brown will be glad to read that *Melanargia galatea* seems to be rapidly spreading over many parts of the Oxfordshire Chilterns where formerly it did not occur. *Pararge megæra* also, which apparently had gone, is now quite common again. On the other hand *Agriades corydon* has failed to appear on the Bucks Chilterns, where it generally swarms, although across the valley it was as common as usual on the Oxfordshire Chilterns. *Colias edusa* has put in an appearance: it frequented the same places where I took this species in 1919. I found a colony

of *Epione advenaria* amongst young ash trees. Obtaining ova I successfully reared them on ash, which is, I presume, their food-plant in that locality. I failed to find larvae of *C. lychnitis* this year, although I left a goodly number the previous year to carry on the species. Possibly they are holding over for another year, as out of sixty pupae only one imago emerged this season. I always find that more than half the number stay a second year in the pupa state. *Agrotis obscura (ravida)* was formerly so plentiful here that I have captured more than 200 in a season, but for the past few years it has appeared very sparingly indeed, my captures being only two or three each season.—A. J. SPILLER; Chinnor.

MARGARODES (GLYPHODES) UNIONALIS AND LEUCANIA VITELLINA IN SOUTH DEVON.—I took two fine *M. unionalis* at ivy in October. The first was taken on the 12th and the second the following night. Wet and windy weather followed and probably destroyed all chance of further captures of this species. Excepting a solitary *Botys asinalis* nothing of note was seen until October 22nd, when my father, Mr. E. J. Milman, called my attention to a *Leucania vitellina* feeding greedily at ivy. We had never before seen this usually skittish moth at ivy. Nocture, with few exceptions, have been very scarce throughout the year, and many captured females have proved infertile.—P. P. MILMAN; Cyprina, Lower Conway Road, Paignton, November 16th, 1920.

BUTTERFLIES IN SOUTH CORNWALL.—From August 14th to September 4th, 1920, I visited South Cornwall. The first week was spent at Penzance, the second and third at the Lizard. Although the weather was generally fine the temperature was low for the district, and the prevailing winds were N. and N.E., so that conditions were not ideal for butterflies. The first capture was a fine specimen of *P. cardui*, seenred with a pill-box (!) on the Land's End. During my stay I took or noted nineteen species. Owing to the winds the sheltered valleys leading to the coves were the most favourable collecting-grounds. Two visits to the Try Valley, mentioned by Mr. G. B. Kershaw in the 'Entomologist,' 1912, proved unfortunate owing to bad weather, although the district looked very promising. A fine day on August 18th in the Lamorna Valley brought thirteen species on the wing, many abundantly. At the Lizard I found the Caerilian Valley a favourable and handy locality. Here *C. edusa* had evidently bred; I saw altogether about a score and took four in perfect, fresh condition. Of the Pierids *P. brassicae* was the common one everywhere, *rapæ* only scanty and *napi* few and worn. All showed the summer variation. *P. megaera* and *P. egeria* swarmed in all parts visited, the former along the Cornish wall-hedges and the latter in more shady places as usual. I took a series of fresh *Egeria egerides* in a small wood at Lamorna, and found the light markings distinctly darker and more fulvous than in specimens I have taken elsewhere. *E. tithonus* abundant everywhere. A few *C. pamphilus*. *E. jurtina* common but getting over. *H. semele* common locally at Mhillion and elsewhere. *P. atlanta*: I never saw this species in such abundance. *P. cardui* also common and generally distributed. *F. io*: A few here and there. I captured a few for inspection and found none with the blue spot on the hind wing (ab. *cyanoptera*).

sticta). *A. urticae*: Scarce. *D. paphia*: Several at Lamorna in very fair condition. Some seemed fresh. *A. aglaia*: Common at Caerthilian. *P. icarus*: Abundant. A few minor variations of the female noted. Elongation of spots on underside, absence of dark scaling on upper side, etc. *C. phœas* swarmed at Caerthilian, the blue-spotted form being frequent. A few *A. flava* at Caerthilian concludes my list. The abnormal weather conditions this year will no doubt explain the somewhat unusual dates for some of the species mentioned.—F. OCTAVIUS CROFT, M.D., F.E.S.; 12, North Hill Road, Headingley, Leeds.

BUTTERFLIES IN THE ISLE OF PURBECK.—The following account of the butterflies taken and of those noted during a month's stay in the Swanage district between August 3rd and 31st, 1920, may be of interest. *P. brassicæ* and *P. rapæ* were common. *P. napi* scarce. *Vanessa io* and *A. urticae* scarce. *P. atalanta* and *P. cardui* abundant, and of the former a large proportion had a white spot in the red band of the fore wings. *M. galatea* common. *C. edusa* was common; thirty-eight were taken by myself and twenty-one by my nephew, who was with me during the latter part of my visit. Of these, four were var. *helice*, two being very fine specimens. Several specimens taken were released, being worn or otherwise damaged. Between August 14th and 26th eighteen specimens of the second brood of *C. minimus* were taken and others noted. *P. aegon* was taken in good condition as late as the 24th, including a dwarf male with curious under-side markings. *A. corydon* was not abundant, but some interesting forms were taken: Six males with orange markings in the spots above the black border on the outer margin of the hind wings; four males with the spots on the hind wings running into the black outer border without white markings; one male with white fringes on the fore wings with a black border on the outside of the fringes; one male var. *fowleri*: one male, fore and hind wings, underside, streaked with brown. *P. icarus* was common without much variation, except one female with the orange spots on the fore wings much enlarged and wedge-shaped, the orange colour extending to the discal spot. *E. jurtina* was common, and one specimen having half the left fore and hind wings bleached was taken. *A. flava* and *T. acteon* common. *C. phœas* scarce. A few *A. bellargus* had emerged before the end of the month. Larvæ of *A. urticae* were taken on August 15th, and up to September 22nd 103 imagines out of 105 pupæ had emerged, all being typical. It was a pleasure to note the total absence of ichneumoned larvæ—a very different experience from that of myself and other collectors last year with this species.—A. M. LONGHURST; Artro, St. James' Avenue, Hampton Hill.

ERRATUM.—Page 280, line 3 from bottom, for "who has been there," read "who has seen them."

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—September 9th, 1920.—Mr. Stanley Edwards, F.L.S., Vice-President, in the Chair.—Mr. J. B. Farmer, of Brixton, was elected a member.—Mr. Bowman

exhibited a series of the spring-emerged half of a brood of *Ephyra porata* from ova, and remarked on their close resemblance to the allied *E. punctaria*.—Mr. Main, larvae of three parasites (Hym.) which attacked the Longicorn (Col.), *Rhagium inquisitor*, in Epping Forest.—Mr. Turner, many species of Heterocera taken by Mr. Grosvenor in India, chiefly Bangalore, including *Attacus edwardsi*, *Trebala rishna*, *Grishna maerops*, *Zygæna cashmirensis*, etc.—Mr. H. Moore, *Mutilla europea* (Hym.) from Bournemouth, with other *Mutilla* species from Egypt, Upper Amazons, Indiana and the Ionian Isles.—Mr. Carr, pupæ of the cheese-mite, *Piophila casei* (Dip.).—Mr. Bennett, the black aberration of *Coccinella hieroglyphica* (Col.) from Keston with the type.

September 23rd.—Mr. K. G. Blair, B.Sc., President, in the Chair.—An exhibition of lantern-slides.—Mr. R. Adkin, views of old Selborne.—Mr. Tonge, resting habit of several British Geometers.—Mr. Main, seasonal forms of *Pieris napi*, stages and pupal chamber of *Timarcha tenebricosa* (Col.), ravages and metamorphoses of *Donacia*, sp. (Col.).—Mr. Withycombe, *Chrysopa*, *Hemerobius*, *Syrphus* and *Stratiomys*.—Mr. Colthirnp, positions of rest of butterflies and moths.

GENERAL EXHIBITS.—Mr. Grosvenor, many species and forms of the genus *Terias* from India.—Mr. Bowman, a bred series of *Trichopteryx carpinata* from Oxshott with numerous forms having well-emphasised transverse lines on the fore wings.—Mr. H. J. Turner, three species of *Euclis* (Lep. Het.)—*E. imperialis*, N. York, *E. grandis*, São Paulo, and *E. sp.*? from Cordoba, Argentine, sent by Mr. Lindemann, with coloured photographs of the larvæ of the last two.

October 14th.—The President in the Chair.—Mr. J. B. Farmer presented a box of British Odonata to the Society's collection.—Mr. Riley, on behalf of Mr. South, for Mr. Dolton, aberrations of (1) *Agriades corydon*, between ab. *albicans* and race *apennina*; (2) *Hybena leucophæaria*, conspicuous wavy lines on a clear ground; (3) dark grey-brown *Bupulus piniaria*.—Mr. Turner, a small race of *Zygæna filipendulae* from Boxhill, with sixth spot very feebly developed, including ab. *cytisi* and other aberrations.—Mr. Newman, living full-fed larva of *Hyloicus pinastri* from Suffolk.—Mr. B. S. Williams, three *Pieris rapæ* showing a discal spot on the hind wings, and a striate, asymmetrical form of *Rumiccia phlaeas*.—Mr. Johnson, banded females of *Pieris napi* from Ireland, one being yellow suffused, confluent *Zygæna trifoli* from Folkestone, and a gynandromorph of *P. rapæ*.—Mr. Grosvenor, *Pieris canidia*, various forms, *P. krueperi*, and *P. rapæ* from India.—Mr. Mera, *Polia chionia* closely approaching form *olivacea*.—Mr. Blenkarn, *Carabus nitens* and other Coleoptera from Poole.—*H. J. TURNER, Hon. Editor of Proceedings.*

RECENT LITERATURE.

Proceedings of the South London Entomological and Natural History Society, 1919-20. Pp. xvi + 104, 2 plates.

As in previous years a number of useful papers were read, that of Dr. Boulenger, F.R.S., on "British Batrachians," being one of the most interesting. E. J. Bennett, M.A., and R. Adkin contributed

biological papers on Lepidoptera, while B. W. Adkin, and the President (S. Edwards) in his address, treated of the economic side of insect life. F. W. Torrington catered for the botanists in a lecture on "British Fern Varieties," while F. W. Frohawk did the like for ornithologists in his paper on "Migration of Birds." The "Abstract of Proceedings" (in places requiring a little more care in editing) contains a mass of useful information, which all naturalists would do well to consult.

W. J. L.

Transactions of the London Natural History Society, 1919.

THOUGH not a bulky volume—45 pp.—this issue shows clearly that interesting and useful work is being done to elucidate the natural history of the district, which the members have mapped out for themselves. Such active practical work testifies to the vitality of the Society. Judging by this volume the work falls under four heads: Entomology, Botany, Ornithology and Archaeology. Perhaps it is a little disappointing that the entomologists seem to have confined their attention almost entirely to two directions only—Lepidoptera, and galls and other cases of parasitism, though, of course, the latter is one of the most important branches of entomology. The volume appears to be carefully edited.

W. J. L.

Annals of Tropical Medicine and Parasitology.

A FEW articles of interest to entomologists have appeared of late: In vol. xiii, No. 3, December 10th, 1919: (1) "Notes on the Bionomics of *Stegomyia fasciata*, Fabr." (Part 1), by J. W. Fielding, pp. 259–296.

In vol. xiii, No. 4, March 15th, 1920: (1) "The Experimental Infection in England of *Anopheles plumbeus*, Stephens, and *Anopheles bifurcatus*, L., with *Plasmodium vivax*," by B. Blacklock and Henry F. Carter, pp. 413–420. (2) "Observations on *Anopheles (Cælodiazesis) plumbeus*," Stephens, with Special Reference to its Breeding-places, Occurrence in the Liverpool District, and Possible Connection with the Spread of Malaria," by B. Blacklock and Henry F. Carter; pp. 421–452, illustrated. (3) "Descriptions of the Male Genital Armatures of the British Anopheline Mosquitoes," by Henry F. Carter; pp. 453–457, illustrated.

In vol. xiv, No. 1, June 30th, 1920: (1) "The Nomenclature of the Parts of the Male Hopopygium of *Diptera nematocera*, with Special Reference to Mosquitoes," by F. W. Edwards; pp. 23–40, 2 illustrations. (2) "Heat and *Stegomyia fasciata*: Short Exposures to Raised Temperatures," by J. W. S. Macfie; pp. 73–82. (3) "On the Results Obtained from Surveys for Breeding-places of Tree-hole Mosquitoes in Liverpool and Neighbourhood," by B. Blacklock and Henry F. Carter; pp. 115–126, illustrated.

W. J. L.

A Catalogue of the Butterflies of Berkshire, with Notes as to Habitats, Localities, History, Aberrations, Dates of Appearance, etc.
By J. E. H. BLACKIE. In type-written MS. Price 1s., from the Author, The Vicarage, Windsor.

WE have received the above type-written list of the butterflies of

Berkshire from the author. It is a careful compilation of pretty well all the information published on his subject, to which are added many useful personal notes and observations. It can be strongly recommended to the notice of local collectors, and to all those interested in the insular distribution of our limited British catalogue of butterflies. Mr. Blackie pays particular attention to local forms occurring in the county, and for this reason, if for no other, his remarks under this head are of special interest.

OBITUARY.

GEORGE B. BROWNE was born August 1st, 1851, and from his youth was a lover of country pursuits, but it was not until early middle life that he commenced to study the British Lepidoptera. He ascribed the awakening of his interest in the subject to the appearance one day in his garden at Lee, in South-East London, of a brilliant ♂ *Apatura iris*—a most unlikely butterfly to occur within the boundaries of London—and when at a later date it was followed by a specimen of *Euvanessa antiopa*, which settled upon the trunk of a tree and was captured by one of his sons by means of a glass tumbler, he was so delighted with the beauty of colouring of the insects that he commenced to collect and study them—a pursuit he followed with undiminished ardour and enthusiasm to the end of his life. In the year 1900 he became a member of the South London Natural History and Entomological Society, and was a familiar figure at its meetings until his removal from London to Benfleet about six years ago. He was, perhaps, best known to his entomological friends as an indefatigable field worker, much of his collecting being done in the neighbourhood of Deal, in Kent, of which district and its lepidopterous fauna he had an extensive knowledge. He was also for many years a frequent visitor to Wicken Fen, and for a time was the owner of some of the fenland there, but a few months before his death the property was transferred to the National Trust, his failing health preventing him from paying further visits to the neighbourhood. On one occasion, when at Wicken, he came across a specimen of *Acronycta strigosa* at rest high up on the trunk of a tree, and after a good deal of difficulty managed to secure it, but it was not until he had returned to his lodgings that he discovered the identity of his capture. Until about four years ago he was remarkable for his vigour and apparent robust health, but an internal disorder which necessitated an operation in 1916 seriously undermined his strength, and lessened his power to resist an attack of pneumonia, which led to his death on Saturday, December 4th, 1920. A man of singularly amiable nature, unassuming, yet intensely practical in the affairs of life, as became his profession of a banker, he was never so happy as when introducing his friends to his best collecting-grounds, and helping them to capture some of the "good things" he had himself taken there. He will always be remembered by them with affection, and his death will be regretted by all who knew him.

A. L. R.

THE ENTOMOLOGIST.

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[No. 693]

SOUTH AMERICAN EUMOLPIDÆ, MOSTLY OF THE GROUP COLASPINI.

By FRED. C. BOWDITCH.

Colaspis, Fabr.

SOME of the unplaced forms on p. 34 of M. Clavareau's list figure out as follows: *Aenea*, Fab., probably a form of *trivialis*, Boh.; *castanea*, Boh., occurs at Cachabe, Ecuador; *ferruginea*, Fab. = *Colaspoides vulgata*, Lef.?; *fulva*, Fab. = *Eriphyllina*? sp.; *fuscitarsis*, Boh., *geminata*, Boh., and *rustica*, Boh., all are valid species from Rio; *humeralis*, Lec., and *puncticollis*, Say., belong to *Nodonota*; *lateralis*, Germ., might be *Sibotes ater*, Lef.?; *rugosa*, Germ., is a well-defined form with a somewhat curved metallic-green stripe from the shoulder nearly to the apex; *unicolor*, Oliv., a Cuban form nearly allied to *trivialis*, Boh., *oregonensis*, Cr., and *chrysis*, Oliv., would seem to be more naturally placed in *Talurus*, Lef., than in *Colaspis*.

Colaspis humeralis, Baly. = *Agbalus*.

Colaspis geminata, Lef., nom. præoc. = *Lefevrei*, Bow.

Alethaxius verrucosus, Jac. = *Colaspis nigrimana*, Lef.

Colaspis aureopunctata, Lef. = *Campylochira* ?.

Campylochira fulvicornis, Jac. = *aureopunctata*, Lef.

Mr. Lefevre, in his description of *Colaspis interstitialis*, 'Ann. Fr.', 1876, p. 141, speaks of the dilation of the hind tibia of the ♂. The males of the following species show something similar:

Colaspis aeruginosa, Germ.—Inner edges dilated at middle third, the rear declination rather abrupt.

C. viridissima, Lef.—Inner edge bluntly dilated a little behind the middle, the front and rear declination even.

C. townsendi, Bow.—Inner edge feebly dilated at about the middle.

C. lebasoides, Bow.—Inner edge gradually dilated to posterior third, then of even width to end.

C. interrupta, Har.—Gradually dilated from middle to end.

C. haroldi, Jac.—The type is ♀; what I consider the ♂ has hind femora with a bifid tooth, tibia rather strongly sinuate both ways at either end of the middle third.

C. interstitialis, Lef.—Inner edge feebly dilated and sinuate at beginning of posterior third.

C. trivialis, Boh.—Inner edge strongly dilated and outer sinuate at the middle third, the rear decline being most abrupt.

C. goyazensis, Bow.—Both edges very feebly sinuate at the posterior third, nearly the same width throughout.

C. geminata, Boh.—Inner edges very gradually dilated to posterior third, then slightly sinuate and straight to end, the outer edge nearly straight.

C. inconspicua, Jae.—Inner edge evenly brought to a point in the middle and sinuate at rear end.

C. dilatipes, Bow.—Inner edge strongly dilated, occupying the posterior part of the middle and anterior part of the rear third, the dilated edge evenly curved from front to rear.

C. klagii, Bow.—Inner edge sharply and evenly dilated to a point just back of the middle.

C. perplexa, Jac.—Inner edge feebly dilated at middle and then straight to tip.

C. punctipennis, Bow.—Inner edge evenly dilated to a point behind the middle, the outer edge rather strongly sinuate.

C. gemmingeri, Har.—Inner edge strongly and evenly dilated at middle, outer edge sinuate back of it.

C. confusus, Bow.—Nee *gemmaingeri*, Har., Jac., 'Biolog.', vol. vi, pt. i, p. 137 : inner edge strongly dilated at posterior third.

Colaspis cribicollis, Lef.

Is described as having wholly fulvous antennæ. In 'Psyche,' vol. xx, p. 125, was published a note on the *phytophaga* of the Stanford expedition to Brazil: specimens from Independencia were referred to this species with a query. The antennæ of the Stanford examples have the seventh and last two articles nearly black and the hind tibia of the ♂ feebly dilated at the posterior third. There is at hand only one example of *cribicollis* ♂, so I am unable at present to definitely establish the Stanford form, but it is very probably distinct.

Jacoby, in 'Biologie,' vol. vi, p. 137, under *Colaspis gemmingeri*, Har., refers to that Brazilian species the Mexican forms, merely stating the former are larger and more narrowed behind; both forms have the hind ♂ tibia dilated within. Von Harold, speaking of his species (the Brazilian), says the tibia dilated at the middle, the Mexican ♂'s have the dilation nearer the apex, therefore I differentiate the latter under the name of *confusus*, Bow. In this connection it may be noted that I have seen no examples of either form from the territory between Honduras and Brazil; I have ten examples from Mexico and fifteen from Brazil.

C. chalcites, Lef., from Peru is described by Lefevre without mentioning any details of the ♂, and my three examples, which apparently came from Lefevre, are all ♀'s. A form occurs in Bolivia which might be this or a closely allied species. The Bolivia ♂ form has a well-marked notch on the inside of the hind tibia at about the beginning of the apical third; until it is compared with a ♂ of *chalcites* I prefer to call them all alike, though they differ somewhat in other details.

Colaspis geminata, Lef.

The four specimens I give this name to are from Rio and Teresopolis, and all are ♀; chestnut brown with æneous colouring; *geminata*, Boh., I identify in a ♂ from Rio, dark bronze colour; it is larger than the foregoing ♀'s, thorax not so heavily punctured and elytra more regularly geminate punctate, and with the hind tibiæ strongly dilated within. For the present I regard the forms as distinct, but if they should prove the same Lefevre's name must sink as a synonym: plenty of specimens from Rio would settle the question.

The types of all the forms hereinafter described are in my collection.

Colaspis toucnsendi, sp. nov.

Form and size of *prasina*, Lef. Body above and below entirely dark purple; legs, palpi, labrum and antennæ flavous, the latter with the last five or six joints dark; thorax grossly confluent punctate, elytra grossly punctured, largely in double series, the intervals more or less raised, giving a semicostate appearance as in *prasina*, Lef.; hind tibia of ♂ sinuate or feebly dilated within.

Type, ♂ and ♀, Jicaltepec, Vera Cruz, Mex. (Townsend).

Length, 7-8 mm.

Head densely and coarsely punctate (except the vertex) with smooth calli near the eye, more or less longitudinally impressed on the vertex; thorax unidentate at the side and sinuate just in advance of the angle, so that it might be called subbidentate; scutel and umbone of the elytra smooth, the latter without visible depression, and crowded with gross punctures which are confused in the neighbourhood of the scutel—heretofore classed in collections as *prasina*, Lef., but separable by the sinuation of the ♂ tibia; it is also apparently a more northern form; the ♀ is somewhat larger than the ♂, tibia plain, last ventral segment with heavy punctures and bluntly notched.

Colaspis lebasoides, sp. nov.

Form of a small *prasina*, Lef.; oblong. Metallic green above and below; feet, palpi, labrum and antennæ flavous, the latter somewhat infuscate at tip; head everywhere densely punctate with usual

smooth calli; thorax thickly and coarsely punctured with several smooth areas on the disc: sides subtridentate, elytra everywhere closely and coarsely punctate, forming more or less continuous transverse rugæ; hind tibia of ♂ dilated at posterior third.

Type, ♂ and ♀, Capetillo, Gua. (Champion) (first Jac. Coll.).
Length, 6 mm.

This species was included by Mr. Jacoby in his *lebasi*, Lef., material, and so referred to in the 'Biologia,' but the tibia of the ♂ show it is distinct: the facies is also somewhat different.

The entire front of the head is almost flat; the dentation of the thorax seems to vary, but the middle angle is well marked, the sinuations before and behind (at a certain angle) giving the subtridentate appearance. The general punctuation of the upper surface is much denser, and the form of the body more tapering than in *lebasi*, coming in this respect next *mexicana*, Jac., from Cordova, Mex.

Colaspis flarofasciata, sp. nov.

Very large. Below with legs flavous, above greenish blue with a broad flavous band across the middle of the elytra connected with the lateral margin (narrowly) and apex (broadly) of the same colour; elytra deeply punctate striate, the intervals strongly elevated costate, nine on each side.

Type, 1 ♀, Chancomayo (ex Donckier Coll. 14).

Length, 13 mm.

Front transversely depressed below the eyes across the epistome, with a deep fovea between the antennæ; vertex sulcate. Blue colour extending from the rear of the head to the transverse groove, and including the fovea, the coloured area coarsely punctate; epistome smooth, convex, deeply emarginate; antennæ flavous, slender, more than half the length of the body, the last six or seven joints darkened; thorax broader than long, quadrate, margined, sinuate on the sides, all the angles prominent, surface grossly punctate, sparsely so on the disc, leaving irregular smooth places; a large deep fovea on each side behind the middle, scutellum smooth, dark fulvous; elytra parallel, regularly punctate striate, the humeral lateral stria splitting just below the shoulder into two parts continued regularly to the apex.

The form of the thorax is analogous to *chrysina*, Oliv., and *cruentata*, Lef., the sculpture of the elytra to the latter; the largest form in my collection, but seemingly undescribed.

Colaspis concolor, sp. nov.

Large. Light brown, with black eyes and mandibles; joints 6 and 7 of the antennæ more or less fuscous; thorax at sides tridentate; elytra without basal depression narrowing toward the apex, thickly semi-regularly punctate; intervals divided by about nine or ten fairly well-defined costæ, so that the punctures are from two to four rows deep.

Type, ♀, Bartica Dist., Br. Guiana (Coll. 406) kindly presented to me by the New York Zoological Park Bureau of Tropical Research.

Length, 9·5 mm.

Head grossly punctate with a deep frontal fovea; thorax wider than long, grossly confluent punctured, with a few smooth areas on the disc, obsoletely depressed on either side behind the middle; scutel with one or two large punctures; the elytral area around the scutellum is depressed, and the thick punctuation gives a semi-opaque appearance.

This form is so large and comes from such a comparatively well-worked district that I am rather surprised not to find any description fitting it.

Colaspis goyazensis, sp. nov.

Like *trivialis*, Boh.; oblong. Above and beneath greenish bronze, with apex of elytra paler; legs pale, with knees, apex of tibiæ and tarsi cyanescent; antennæ long and slender, rufous, becoming fuscous after the middle; palpi and labrum rufous, thorax unidentate at about the middle; upper surface thickly punctate, the elytra mostly in double series with smooth, more or less raised longitudinal intervals which become costate at the apex. Hind tibia of ♂ nearly simple, very feebly sinuate.

Type, 4 ♂ and 1 ♀, Mineiro, Goyaz, Brazil.

Length, 5·5–6 mm.

Head closely punctate, moderately longitudinally impressed on the front with the usual smooth calli; thorax thickly coarsely punctate; sides angulate at the middle and sinuate before; the punctuation of the elytra is more or less confused near the scutel in the ♀. Allied to and resembling *trivialis*, Boh., but easily separated by the very different hind tibia of ♂. The general appearance is bronzy-green with apex of elytra pale.

Colaspis dilatipes, sp. nov.

Like a large *trivialis*, Boh.; elongate. Shining, bronzy brown; legs and antennæ more or less rufous; head finely, thorax coarsely, thickly punctate; sides strongly angulate at middle, ♂ with median smooth line; elytra regularly biseriate punctate, with raised longitudinal smooth intervals, which are costate at the rear; hind tibia of ♂ strongly dilated below the middle, forming a blunt bulge within.

Type, ♂ and ♀, Ceara-Mirim, Rio Grande de Norte, Brazil (W. M. Mann).

Length, 7–7·5 mm.

Head densely punctate, faintly longitudinally sulcate, with prominent smooth calli; antennæ dark, with the bases of the joints light, thorax widely margined and prominently angled at the sides and with a post-median depression on each side (more

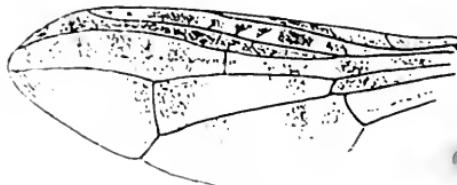
noticeable in ♂); the elytral punctuation is almost entirely regular (even near the scutel), and with the punctures on each interval more or less confluent; in some intervals, especially towards the sides and rear, the intervals are widened and punctures increased; body below nearly black in ♀. Nearly allied to what I call *geminata*, Boh., from Rio, but separable by the hind tibia of the ♂.

(To be continued.)

AN ORTALID FLY IN BRITISH AMBER.

By T. D. A. COCKERELL.

In the 'Transactions of the Norfolk and Norwich Naturalists' Society,' vol. v, pp. 92-95, Mr. Alfred S. Foord described the insects found in amber washed up on the shore in the vicinity of Yarmouth, Norfolk. A plate was given with numerous figures. Only two species of insects were specifically determined, *Apis*



Scholastes foordi.

mellifera (mellifica) and *Blatta orientalis*; the latter determination is incorrect. The specimens are all in the Museum of Geology of Cambridge University, where I examined them years ago. Recently, with the kind permission of Prof. Marr, I have again had them out for examination, and have figured and described one of the species as follows:

Scholastes foordi, n. sp.

Broad, about 9 mm. long, the abdomen turned downward at end. Dusky, testaceous beneath, apparently darker above; vertex dark, but not black, without the pallid transverse stripes of *S. cinctus*, Guér.; apical joint of antennae whitish; dorsum of thorax bare, but four strong lateral bristles in a longitudinal row anterior to the wings, exactly as in *S. vicarius*, Hend.; the scutellar bristles are also similar, but whether six I cannot determine; abdomen broad and short, as usual in the genus; venation also as in living species, but the second vein not so distinctly elevated or humped about the middle and lower apical corner of discal cell less produced; pattern of wings less pronounced than in the living species, but of the same type (for details see figure).

This is fig. 7 of Foord's plate, which shows the whole fly.
I am much indebted to Mr. C. G. Lamb, Mr. F. W. Edwards

and Mr. Hugh Scott for assistance when studying this fly. As close a comparison as I was able to make showed no important difference from the modern genus *Scholastes*, Lw., 1873. Superficially the fly is perhaps rather more like the species of *Euprosopia*, but the submarginal cell, contracted before the end, agrees better with *Scholastes*. The existing forms of *Scholastes* are smaller. The question has arisen whether these pieces of amber are genuinely British. There are two alternative possibilities :

(1) That the specimens are "faked" for sale. After careful consideration I am sure this must be considered out of the question, as all contain minute insects or spiders, which surely would not have been put in by an artificer.

(2) That the specimens are in copal from Africa, being either imported and sold as native amber, or possibly derived from the wreck of a ship. The material looks very much like copal, but the two honey-bees are too large for the African *Apis unicolor*, Latr., which they should presumably be if in copal. They can only be referred to *A. mellifera*, the black variety with slightly pallid scutellum.

Assuming that the amber is genuinely British, we can say definitely that it is not contemporaneous with the Baltic (Oligocene) amber. All the bees in Baltic amber seen by me belong to extinct genera, and this amber nearly always contains trichomes of the oak, absent from the Yarmouth material. The Ortalid now described is of an Ethiopian or Oriental type, but I cannot identify it with any species in the British Museum. African copal may be Pleistocene or recent, and the older copal probably contains at least some extinct species. The fly, so far as it goes, distinctly suggests that the material may be copal, but it might very well occur in Britain in amber of upper tertiary age, say Pliocene. The question is a very interesting one, and it is to be hoped that further and more definite evidence will be found. Miocene amber is known from other parts of Europe.

THE MACRO-LEPIDOPTERA OF COUNTY TYRONE.

By THOMAS GREER.

(Continued from vol. liii, p. 277.)

NOCTUIDÆ.

Acronyctinæ.

Demas coryli, L.—Locally abundant at Favour Royal (K.), Killymoon and near Lissan ; larvæ on birch and sallow.

**Aeronycta leporina*, L.—A single example in the Lough Neagh district, June, 1920 ; a pale form.

Aeronycta megacephala, Fb.—Rare, near Favour Royal (K.).

**Acronycta tridens*, Schiff.—Several bred from larvæ found near Stewartstown.

Acronycta psi, L.—Very abundant.

**Acronycta menyanthidis*, Vw.—Not uncommon; a number bred from larvæ found at Lough Neagh; var. *scotica*, Tutt; a few larvæ on *Myrica gale* at Lough Fea (H.).

Acronycta rumicis, L.—Abundant generally; var. *salicis*, Curt., not uncommon at Favour Royal (K.) and also locally.

Trifinæ.

Agrotis (Euxoa) segetum, Schiff.—Very abundant, less common in the autumn; varying from light brown to almost black.

**Agrotis (E.) vestigialis*, Rott.—Not uncommon at ragwort and heather bloom on the sandy shore at Washing Bay, L. Neagh; this locality is almost thirty miles from the sea, as the crow flies.

**Agrotis (E.) corticia*, Hb.—Rare at light, and at privet blossom.

**Agrotis (E.) cinerea*, Hb.—A single specimen, taken at light at Tullylagan near Cookstown, June, 1897.

**Agrotis (E.) nigricans*, L.—Locally abundant at ragwort at Killymoon; Loch Fea and near Lough Neagh; dark form ab. *fumosa*, Haw.

**Agrotis (E.) tritici*, L.—Not uncommon, with var. *aquilina*, God., on sandy ground at Killymoon; rarer near Stewartstown.

Agrotis (Feltia) exclamacionis, L.—Very common, varying from pale brown to black.

Agrotis ypsilon, Rott.—Fairly common at sugar and ivy bloom; var. *pallida*, Tutt, occasionally.

Agrotis (Lycophotia) strigula, Thnb.—Abundant on heathery ground; the local form, dark red.

**Agrotis (Peridroma) saucia*, Hb.—Sometimes not rare at sugar and ivy; single examples of ab. *margaritosa*, Haw.

**Agrotis (Eueretagrotis) agathina*, Dup.—Locally abundant in the district on the bogs. The following forms have occurred: *hebridicola*, Stand., *rosea*, Tutt, and *scopariae*, Mill.

Noctua (Exarnnis) augur, Hb.—Abundant and widely spread.

Noctua glareosa, Esp.—Kane states that this species is rare at Favour Royal; not uncommon at heather bloom in this locality and widely distributed.

Noctua baja, Fab.—Generally common at sugar and grasses.

Noctua c-nigrum, L.—Abundant in this district at *Glyceria fluitans*, although Kane states that it is scarce generally in Ireland.

Noctua triangulum, Hufn.—Not common, but widely distributed; Lissan, Lough Fea and at Killymoon.

Noctua brunnea, Fb.—Locally abundant generally in the county; blackish forms near Lough Fea.

Noctua primulæ, Esp.—Abundant everywhere at sugar and thistles; Kane records var. *conflua*, H. S., from Tyrone; an example with the square spots on fore-wings connected by a dark line under the orbicular.

Noctua dahlii, Hb.—Locally abundant in the county; Kane took a very dark form var. *perfusca* at Favour Royal, and I have met with the same aberration near Tamnamore, Lough Neagh, some of the males from this locality being almost black.

Noctua rubi, View.—Abundant generally and double brooded.

Noctua umbrosa, Hb.—Common and widely spread, often in swarms at *Glyceria fluitans*, sugar having little or no attraction when this grass is in flower.

Noctua (Segetia) xanthographa, Fb.—Abundant everywhere, varying from a grey to a black form, ab. *nigra*, Tutt.

Noctua (Ochropleura) plecta, L.—Very common.

Axylia putris, L.—Generally common.

Triphæna (Agrotis) orbona, Fb.—Abundant and widely distributed; the var. *ruja*, Tutt., is not rare.

Triphæna (A.) pronuba.—Very abundant.

Triphæna fimbria, L.—Larvæ abundant in the spring on sallow and birch, but the imago is seldom seen.

Triphæna ianthina, Esp.—Abundant at heather blossom and ragwort.

Eurois prasina, Fb.—Abundant at Favour Royal and Altadiawan (K.), not uncommon locally in woods.

Aplecta (Mamestra) nebulosa, Hufn.—Rarer than the preceding species; a few near Cookstown (H.).

Barathra brassicæ, L.—Kane found this species common everywhere; in this district (E. Tyrone) it is distinctly rare.

Mamestra oleracea, L.—Abundant everywhere; some specimens have only a trace of the reniform stigma.

Mamestra thalassina, Rott.—Abundant at sugar in June; Kane found var. *achatis*, Hb., at Favour Royal.

Mamestra pisi, L.—Locally abundant; var. *splendens*, St., at Favour Royal (K.); also at Lough Fea. Kane records a brown form from the county and also var. *distincta-scotica*, Tutt.

Mamestra glauca, Hb.—Kane took this in abundance on the moorlands at Altadiawan; sometimes common at *Vaccinium myrtillus* growing in gulleys and ravines on the mountains near Lough Fea; 900 to 1000 ft.

Mamestra dentina, Esp.—Common and widely spread.

Dianthæcia conspersa, Esp.—Abundant generally in the county; larvæ on *Lychnis flos-cuculi* and *Selene inflata*; var. *suffusa*, Tutt.; occurs near Lough Fea.

Dianthæcia capsincola, Hb.—Less abundant than the last species; larvæ on *S. inflata* only.

Dianthæcia cucubali, Fues.—Abundant at *Lychnis* flowers in damp localities.

**Hecatera serena*, Fb.—Not rare at bladder campion, *S. inflata*, near Grange, also at Lissan and near Stewartstown; some examples with fore wings suffused with grey.

Epineuronia popularis, F.—Males often abundant at light, females at rest on grasses.

Charæus graminis, L.—Abundant generally on moory ground.

Eumichtis (Hadena) adusta, Esp.—Common and widely spread; dark forms at Lough Fea.

**Eumichtis (H.) protea*, Bkh.—A single example at sugar, Curglasson, September, 1916; a second specimen at Stuart Hall, September, 1920.

Luperina testacea, Hb.—Not uncommon at light, var. *nigrescens*, Tutt; at Lough Neagh.

**Cerigo matura*, Hufn.—Not rare at sugar and light; at Killymoon, Lissan, and near Stewartstown.

**Celena haworthii*, Curt.—Abundant on moorlands and bogs; not uncommon in a marsh near Stewartstown, where *Eriphorum* is absent: the larva probably feeding on *Carex* or *Glyceria*; the form here is dark and obscurely marked, very different from the moorland type, which is purplish red.

**Hama furva*, Hb.—Rare at ragwort, near Lissan.

Apamea gemina, Hb.—Very abundant at grasses, var. *remissa*, Hub., not uncommon; and also at Favour Royal (K.).

**Apamea unanimis*, Tr.—Locally abundant in the district wherever *Phalaris arundinacea* is found in any quantity; Prof. J. W. Harrison took larvae near Cookstown: the imago is to be taken at dusk, and later, with the aid of a light, flying over or at rest on this grass, and seldom comes to sugar here.

Apamea basilinea, Fb.—Very abundant; the var. *jinitima*, Gu., at Favour Royal (K.).

Apamea secalis, L.—Very abundant everywhere, varying from a dirty grey to black in banded and unicolorous forms.

**Apamea ophiogramma*, Esp.—Locally common and widely spread; frequenting *Glyceria*, growing in damp ditches and marshes. Localities: Near Lissan, Grange, at Stewartstown, and in the Lough Neagh district.

Miana strigilis, Clerck.—Abundant at sugar in the following forms: Vars. *latruncula*, Lang., *aerata*, Esp., and *fasciata*, Tutt.

Miana fasciuncula, Haw.—Common generally; var. *suffusa*, Tutt., at Favour Royal (K.).

**Miana literosa*, Haw.—Almost as abundant as *M. strigilis* in this locality, the imago frequenting grasses in the marshes and ragwort on pasture-land.

**Miana bicoloria*, Vill.—Not common; a dull putty-coloured form, var. *terminalis*, Haw.

Xylophasia rurea, Fb.—Very abundant; the greyish-white (type) form not uncommon; var. *combusta*, Haw.r, are.

Xylophasia lithoxylea, Fb.—Common and widely distributed.

Xylophasia sublustris, Esp.—Very local at Favour Royal (K.).

Xylophasia monoglypha, Hufn.—Abundant everywhere, varying from a pale form to vars. *infuscata*, White, and *ethops*, Tutt; the latter not uncommon at Lough Fea and also near Favour Royal (K.).

Xylophasia hepatica, L.—Kane records this species as very local at Altadiawan and Favour Royal.

**Aporophyla nigra*, Haw.—Rare at sugar, Killymoon.

Miselia oxyacanthæ, L.—Abundant at sugar and ivy bloom; one ab. *capucina*, Mill., near Killymoon; a dark form approaching this at Favour Royal (K.).

Agriopis aprilina, L.—Rare in the county (K.); a single example at sugar near Lissan.

(To be continued.)

NOTES ON THE VARIATION OF *PERONEA CRISTANA*, FAB., WITH DESCRIPTIONS OF SIX NEW FORMS, AND THE REASONS FOR SINKING THE NAMES AT PRESENT IN USE OF SIX OTHERS.

By W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 16.)

Ab. *ulotana*, Clark. After very careful study I am convinced that this aberration is identical with ab. *sericana*, Hüb.

Clark describes this (*loc. cit.*, p. 291), "anterior wings dark slate-colour, with a bright red streak which proceeds from the base to the large button, which is also red"; and of ab. *sericana*, Hüb., he says, "fore wings of a purplish grey, but with a bright orange median longitudinal line from base to beyond the middle of wing, edged above with a darker line running up to apex."

To the "purplish-grey" colour of *sericana* one must give a certain latitude, for, as is well known, Hübner's figures vary a good deal, and in the six copies of his work I have been able to consult, no two give the ground-colour of this figure exactly the same; in one at least it is practically identical with Clark's type of *ulotana*, which, moreover, has the front of the superiors "edged with a darker line running up to the apex," described by Clark as characteristic of *sericana*. By far the most striking character of *ulotana* is the "bright red streak which proceeds from the base to the button," and this is identical in both forms; the name *ulotana*, Clark (1901), should therefore sink in favour of the much older one of *sericana*, Hüb. (1796).

Ab. *nigropunctana*, Clark, comes near to ab. *julirostriana*, Desvignes. Clark says "it is easy to distinguish it from *albibunctana*, Stephens., and *ochreapunctana*, Clark, because it has an almost black button and the others have light ones," but he does not

allude to the much more difficult task of distinguishing it from *fulrostriana*, Dsvgs., which, as the latter says, is "similar to *striana* except for a fulvous vitta." The type of *nigropunctana* is correctly described by Clark. I should differentiate it from *fulrostriana* by the more uniform-coloured disc of the superiors, this is more ochreous than in *fulrostriana*, which I should call reddish brown; it has also an orange vitta instead of a lighter fulvous one. Clark's ambiguous description has led me into an error in including in the list of captures in my paper (*loc. cit.*, p. 269) six examples of *nigropunctana*; all but one should be *fulrostriana*. I have only one other example of *nigropunctana*, which was taken in the New Forest in 1918. I consider it an extremely rare form. The Webb series is hopelessly mixed: of thirty-four specimens (apart from the type) only eight agree with it, eight are ab. *provittana*, Dsvgs., one is *combustana*, Dup. = *sequana*, Curtis, and the remainder can only be called *fulrostriana*, Dsvgs. Apart from the *fulrostriana* alluded to above, Webb had nineteen examples in one part of his series and ten in another part. His series of sixteen so-called *provittana*, Dsvgs., can, as previously stated, only be designated *fulrostriana* also. Evidently the task of separating these very similar forms was utterly beyond the powers of his eyesight.

There are six series in the Webb Collection that do not agree with any named forms, and as they are all quite distinct and recurrent I propose to give them names.

The first is one of the white forms, which I propose to call ab. *flavana*, n. ab. This was described by Webb, but not named, in his paper (*loc. cit.*, 'Entomologist,' vol. xlvi, p. 200) as follows: "Basal half of wings dirty yellow, with a few reddish markings at the base. The red line from the button terminates at the costa before the apex, and is strongly pronounced; it is continued towards the base after having been interrupted by the central white tuft and pale fascia, then along the outer edge of the vitta to the base of the wing. The white clouds in the hinder third of the wings are distinct and well defined, and the ends of the wings are red brown." This description is correct and I have adopted it. In the Webb Collection there are two examples of this form, which is a very handsome one. These, as he says, came from the Clark Collection "as *tolana*, with which they have no affinity." I also have two examples from the New Forest, and Mr. South has one. I believe ab. *flavana* to be purely a New Forest form.

Ab. *southiana*, n. ab. I give this name after Mr. R. South who first interested me in *Peronea cristana* and who has done so much for entomology, to a very handsome form, of which there are four specimens in the series, three of which came from Clark; it is alluded to by Webb as wanting a name (*loc. cit.*, vol. xliv, p. 291), and I describe it as follows:

Exactly as *semiustana*, Curtis, but with pure white vitta, button, subsiding tufts, head and thorax. The specimens are all without data, but Webb says: "Several specimens have been taken in the New Forest." Mr. South has an example of this form, which also came from the New Forest.

Ab. webbiana, n. ab. This form is similar to the last, with the exception that the vitta, button, subsidiary tufts, head, palpi and thorax are cream-coloured instead of white, and the ground colour of the superiors is darker. There are half a dozen examples in the collection, two from Folkestone (Purdey), one Epping Forest, no doubt from Clark, and three without data. I believe this is not an uncommon aberration at Folkestone, and I have obtained two this year from the New Forest. The form is of course named after Sydney Webb.

Ab. fulvana, n. ab. Exactly as *desfontainana*, Fab., but with only a trace of a button. The examples, nine in number, were labelled by Webb ab. *sericana*, Hüb. They are old specimens, set on white pins, without data, except that one is labelled "Sheppard's sale" and another "Bond Collection"; the form is a not uncommon one in old collections, but I do not know of any modern examples, and presume it came from a locality that no longer produces *cristana*.

Ab. ustulana, n. ab. This form is the one that at present is usually, but erroneously considered to be ab. *prorittana*, Dsvgs. It is exactly as ab. *semiustana*, Curtis, but has a cream-coloured vitta, head, palpi and thorax; it is a well-known and striking form, not uncommon in the New Forest, from which I have a series of fifteen specimens. There were four in the Webb Collection, three of which were labelled "Bond Colln."; the other was unlabelled.

Webb states (*loc. cit.*), vol. xliii, p. 266, "The old students of *cristana* regarded a 'similarly colored' (to *proxanthorittana*, Clark) 'brown tufted insect' as *xanthorittana*, Desvignes.

As the true *xanthorittana*, Desvignes, is without, or has only a small button, it follows that the form quoted by Webb is at present without a name, for clearly he refers to a form with a button of average size; his suggestion (*loc. cit.*) that the name *proxanthorittana*, Clark, should be transferred to it being homonymous is invalid in accordance with the laws governing nomenclature. I therefore give it the name *fulropunctana*, n. ab., and describe it thus.

Superiors reddish brown, with the bases, costal blotch, and some smaller areas of a slightly darker brown colour, giving the whole wing a somewhat mottled appearance; the button is bright red-brown; the head, palpi and thorax are a dark cream colour with red-brown scales intermixed; the vitta is a rich yellow.

There are sixteen examples in the series; all old specimens, three of which date before 1850. All are without data with the

exception of five, two of which are labelled "Bond Collection"; one "Mason Collection": one "Webb, New Forest, 1891," and one "Harper Collection"; they were placed by Webb next to his series of *xanthovittana*, Desvignes, and were not named.

I have been repeatedly asked what method I adopt in arranging the forms of *cristana* in the cabinet. There is only one method which I can conceive has anything to recommend it, and that is, in groups. Webb, in his paper (*loc. cit.*), adopts this method, but he does not make any attempt at a natural sequence. My arrangement, which I give for what it is worth, observing that it does not pretend to be perfection, is as follows:

I divide the forms into nine groups, which I call the *cristana*, *chantana*, *spadiceana*, *ruficostana*, *striana*, *profanana*, *desfontainana*, *cristalana*, and *capucina* groups, and arrange them in the following order:

(1) *Cristana* group. Forms with plain unicolorous ground-colour to the superiors, with or without vitta, and button, and including the following aberrations: *Cristana*, Fab., *albipunctana*, Stphs., *ochreapunctana*, Clark, *fusca*na, Clark, *nigrocristana*, Clark, *albonigrana*, Clark, *alboflammana*, Curt., *subalboflammana*, Clark, *fulropunctana*, Sheldon, *xanthovittana*, Desvignes, *nigropunctana*, Clark, *subrittana*, Stphs., *punctana*, Clark, *nigrosubrittana*, Clark, *unicolorana*, Desvignes, and *subunicolorana*, Clark.

(2) *Chantana* group. Forms with the front half of the superiors from a line drawn from the inner margin of base to near the apex chestnut colour, including abs. *chantana*, Curt., *postchantana*, Webb, *prochantana*, Clark, *subchantana*, Clark, and *caughaniana*, Webb.

(3) *Spadiceana* group. Forms with the front half of the upper wing from the inner margin of base to near the apex different shades of brown, including abs. *spadiceana*, Haw., *rivittana*, Stphs., *intermedia*na, Clark, *brunneana*, Stphs., *substriana*, Stphs., and *rufinigrana*, Clark.

(4) *Ruficostana* group. Forms with the front portion of the superiors from the inner margin of the base to a point on the costa near the apex dark brown or black, the other portion of superiors, with the exception of the inner margin, being grey. Button very small or not existing, including abs. *ruficostana*, Curtis, *alboruficostana*, Clark, *attaliana*, Clark, *nigrocostana*, Clark, and *transversana*, Clark.

(5) *Striana* group. Forms with the disc of the superiors plain brown or black, but with lighter markings in the anal angle, and the vitta striated with dark lines including abs. *striana*, Haw., *prostriana*, Clark, *merlana*, Clark, *insulana*, Curt., and *fulvostriana*, Desvignes.

(6) *Profanana* group. Forms with superiors brown or black more or less mottled with darker colour, including abs. *profanana*,

Fab., *provittana*, Dsvgs., *semiustana*, Curt., *semistriana*, Dsvgs., *bentleyana*, Curt., *ustulana*, Sheldon, *southiana*, Sheldon, *webbiana*, Sheldon, *atrana*, Clark, *jansoniana*, Webb, *subnigrana*, Image, *nigrana*, Clark.

(7) *Desfontainana* group. Forms with the front portion of superiors from the inner margin of the base to a point on the costa near the apex reddish-orange (except in ab. *sericana*, and ab. *flammeana*, in which it stops at the button), the ground colour being shades of grey or slate colour, including ab. *desfontainana*, Fab., *fulvana*, Sheldon, *consimiliana*, Stphs., *sericana*, Hüb., *flammeana*, Webb, *alborittana*, Stphs., and *fulvochristana*, Stphs.

(8) *Cristalana* group. Forms with the superiors much variegated with lighter and darker markings, the ground-colour grey or brown, including ab. *cristalana*, Donovan, *procrystalana*, Webb, *subcristalana*, Curtis, *fulvorittana*, Stphs., *subfulvorittana*, Clark, and *combustana*, Dup.

(9) *Capucina* group. Forms with the ground-colour of the superiors almost or quite white, mottled with grey or reddish-grey, and including ab. *capucina*, Johnson, *subcapucina*, Desvignes, *purdeyana*, Webb, *gumpinana*, Johnson, *masoniana*, Clark, *curtisana*, Desvignes, *tolana*, Desvignes, *flavana*, Sheldon, and *ochreana*, Sheldon.

It is very difficult to decide where to place a few of the forms, which have affinities with more than one group. Amongst these are *substriana*, Stphs., *rufinigrana*, Clark, *semistriana*, Dsvgs., and some of the melanic forms.

(To be continued.)

THE OCCURRENCE OF *THEOBALDIA ARCTICA*, Edw., IN ENGLAND.

BY HENRY F. CARTER.

In January, 1920 ('Bull. Ent. Res.', x, p. 136), Mr. F. W. Edwards, of the British Museum, described a mosquito of the genus *Theobaldia* under the name *T. arctica*. This species, which was represented by a single male captured at Archangel, much resembled the common European *T. annulata*, Sch., and was almost identical in coloration with *T. alaskäensis*, Lud. (1906), and *T. siberiensis*, Lud. (1920). The last-named species is known from the female only, but the Archangel form apparently differed slightly from *T. alaskäensis* in the structure of the male hypopygium, and on this account and in view of its widely different place of origin it was accorded specific rank. In a later note ('Scottish Naturalist,' May-June, 1920) the same author recorded *T. arctica* as new to the British faunal list, having received four specimens (1 ♂, 3 ♀) from Dumbarton and Edinburgh. He also stated that he was "now inclined to

regard these names (*i.e.* *T. alaskäensis*, *T. siberiensis* and *T. arctica*) as indicating, at most, slight local variations of a single species of holarctic distribution." In the same paper, however, he suggests provisional retention of the name *T. arctica* until males from Alaska and Siberia are available for comparison.

Recently, having occasion to examine a series of preparations of the male hypopygia of *T. annulata* in the collection of the Liverpool School of Tropical Medicine, a specimen labelled "Cheshire 1912" was discovered which differed considerably from the others, but agreed with the characters given by Edwards for *T. arctica*. The male from which this preparation of the hypopygium had been made was then examined, and its coloration found to correspond closely with that described for *T. arctica* and *T. alaskäensis*. Subsequently a search through the *T. annulata* material in the collection revealed the presence of a second male of *T. arctica*; this specimen was labelled "bred from larva, Cheshire, 1912." Unfortunately more exact data regarding these two specimens cannot be given, but it is highly probable that both were reared from larvae, and that these were present in a mixed sample of mosquito larvae collected in the Wirral Peninsula and intended for demonstration purposes.

The existence of *T. arctica* so far south as Cheshire is of considerable interest; its unexpected appearance in this county emphasises the need—already indicated by recent discoveries—for more consistent and detailed work in connection with our indigenous mosquitoes.

Liverpool :
October, 1920.

THE HETEROPTERA OF INDO-CHINA.

BY W. L. DISTANT.

(Continued from p. 6.)

NEONIPHE, gen. nov.

Closely allied to *Niphe*, Stål, but differing from that genus by the strongly-spined anterior femora, which are closely serrated beneath with a prominent spine before apex.

Neoniphe armata, sp. n.

Ochraceous, thickly rather finely darkly punctate; pronotum with a series of six impressed dark spots on anterior area; eyes pale dull castaneous; scutellum more darkly punctate on anterior area, the basal margin with pale ochraceous linear spots and the disc with indications of a central pale longitudinal fascia; corium paler on extreme lateral margin and with a narrow sublateral paler line

membrane pale fuscous; body beneath and legs ochraceous, finely darkly punctate, tibiae more ochraceous and less punctate; rostrum about reaching posterior coxae, its apex black; antennae sanguineous second joint very much longer than third, remainder mutilated.

Long, 12 mm.

Tonkin; Hagiang.

Tolumnia latipes.

Pentatoma latipes, Dall, List. Hem. i, p. 238 (1857); var. *contingens*, Walk. Cat. Het. ii, p. 302 (1867).

? *Tolumnia ferruginescens*, Bredd. Wien. Ent. Zeit. xxiii, p. 7 (1904). Luang Prabang.

This species, which I previously placed as a var. of *T. latipes*, Dall., is also probably the *T. ferruginescens*, Bredd.

Hoplistodera tonkinensis, sp. n.

Ochraceous, sometimes distinctly darker in hue on basal areas of pronotum and scutellum; head above somewhat coarsely punctate, the central lobe distinctly prominent; antennae ochraceous, second and third joints shortest; pronotum coarsely punctate, the lateral angles produced in robust subacute spines, their apices slightly reflexed backwardly, and with a notched tubercle beneath at about half their length; scutellum with about basal half coarsely, sparingly, and irregularly punctate; body beneath and legs a little more darkly ochraceous; rostrum extending a little beyond posterior coxae.

Long, $6\frac{1}{2}$ - $7\frac{1}{2}$ mm.; breadth between pronotal angles, 7 - $7\frac{1}{2}$ mm.

Tonkin, Chapa; Haut-Mékong, Tong Lap.

Allied to *H. incisa*, Dist. from British India, but a much narrower species, especially in the breadth between the pronotal angles; the third and fourth joints of the antennae much shorter, etc.

Hoplistodera scutello-maculata, sp. n.

Head, pronotum and scutellum brownish ochraceous or pale castaneous, anterior area of head more or less mottled with obscure ochraceous, central lobe usually more or less piceous; pronotum coarsely darkly punctate, its anterior area with luteous waved corrugations, and a transverse piceous spot on each side before anterior margin; scutellum with distinct luteous reticulate fasciae, thus giving the ground-colour a maculate appearance, three luteous spots on basal margin, and the whole surface more or less somewhat finely distinctly punctate; corium more or less coarsely punctate; conhexivum dull ochraceous, with pale castaneous segmental maculations; body beneath pale castaneous, the legs stramineous; antennae pale brownish, the basal areas of the joints much paler in hue, third joint shortest, second and fourth subequal in length, apical joint longest; lateral pronotal angles strongly and robustly produced, their apices somewhat acute.

Long, $6\frac{1}{2}$ -7 mm.; breadth between pronotal angles, $6\frac{1}{2}$ -7 mm.

Luang Prabang; Haut-Mékong, Ban Silah, Tong Lap, Vieng Vai.

Allied to *H. convexa*, Dall., from the Philippines.

SACONTALA, gen. nov.

Head a little longer than broad, obliquely deflected, broadest and truncate at apex, the anterior lateral angles produced, the lateral margins concave; pronotum about twice as broad as long, the lateral angles strongly and broadly produced; scutellum broad, considerably passing apex of corium, which is short; membrane short but broad; posterior femora with a short tooth beneath near apex.

Allied to *Hoplistodera*, but differing by the broad and truncate head, etc.

Saccontala rugulosa, sp. n.

Head black, obliquely deflected, thickly somewhat coarsely punctate, the anterior lateral angles produced outwardly, the lateral margins strongly concave; pronotum, scutellum and corium bronzy brown, coarsely punctate and rugulose, pronotum with a distinct central longitudinal carinate line, the lateral angles broad, strongly transversely and a little forwardly produced, their apices concavely angulate; scutellum about as long as broad at base, the basal area moderately elevated and rugulose, remaining area coarsely punctate, the basal angles black; corium short, considerably shorter than scutellum, coarsely punctate; membrane pale bronzy brown, the venation darker; body beneath imperfectly seen in two carded specimens, but apparently coarsely darkly punctate; legs black, annulated with ochraceous, posterior tibiae only black at base; antennæ mutilated in the two specimens now before me.

Long, $6\frac{1}{2}$ -7 mm.; breadth between pronotal angles, 6-7 mm.

Tonkin; Chapa.

Stenozygum speciosum.

Strachia speciosum, Dall, List. Hem. i, p. 261 (1851).

Stenozygum speciosum, Dist. Faun. Brit. Ind. Rhynch. Het. i, p. 193, fig. 115 (1902).

Laos, Ventiania; Tonkin.

In nearly all the specimens of this species which I have examined the reddish markings as seen in typical specimens are absent and replaced by luteous coloration.

Agathocles dubius, sp. n.

Dark blackish-castaneous, lateral marginal areas of the corium paler but finely darkly punctate; membrane paler, reflecting the dark abdomen beneath, the veins darker; body beneath black, thickly finely punctate; legs dull dark ochraceous; rostrum reaching the intermediate coxae; head longer than broad, the lateral lobes longer than the central, somewhat convexly narrowed to apex; first joint of antenna about reaching apex of head, second a little shorter than third, fourth or fifth, which are subequal in length, apical joint with its basal area paler in hue; eyes somewhat prominently exserted; pronotum punctate and moderately rugulose, the lateral margins narrowly reflexed, the anterior and posterior angles slightly produced; scutellum finely punctate and moderately transversely rugu-

lose; corium somewhat coarsely sparsely punctate; rostrum about reaching the intermediate coxae; body elongate.

Long, 14 mm.; breadth between pronotal angles, 7 mm.
Luang Prabang, Van Nham.

Prionica tonkinensis, sp. n.

Body above dark chocolate brown, thickly coarsely punctate, and with some small scattered obscure ochraceous spots; antennae black, first joint not reaching apex of head and reddish ochraceous at its base, second joint about as long as third and fourth joints together; pronotum with the lateral angles moderately robust and anteriorly and somewhat upwardly produced, the whole of the lateral margins (including spines) coarsely serrate; scutellum slightly passing base of membrane, which is bronzy-brown; other structural characters as in generic diagnosis.

Long, 10-11 mm.; breadth between pronotal angles, 10-11 mm.
Tonkin; Chapa.

Allied to *P. nigrescens*, Dist.

Menida laosana, sp. n.

Body above dark ochraceous; head, pronotum and corium somewhat thickly, darkly punctate; antennae ochraceous, apical joint distinctly darker in coloration; eyes black; pronotum with a sublateral margin of small black punctures, and two transverse waved lines of very dark punctures on anterior area; scutellum paler in hue, more greenish ochraceous, a pale smooth spot in each basal angle and a few minute pale spots on each lateral margin, the apex distinctly paler in hue and sparingly blackly punctate; corium darkly punctate, membrane more pale bronzy in hue, the veins prominently darker in hue; wings imperfectly seen, bronzy green, with the veins distinctly darker in hue; body beneath imperfectly seen in carded type, pale ochraceous, the venation and stigmatal spots darker, and a broad submarginal blackish spot on each side of metasternum.

Long, 8 mm.
Laos; Luang Prabang.

Menida raja, sp. n.

Body above dark shining indigo-blue; head dark ochraceous, finely darkly punctate, a large transverse basal ochraceous spot to scutellum, which is slightly centrally angulate on its posterior margin; membrane pale brownish ochraceous with the venation darker in hue; body beneath imperfectly seen in carded type; antennae ochraceous, extreme apices of the first, second and third joints darker in hue, remaining joints mutilated; pronotum thickly finely punctate; scutellum thickly, finely, somewhat indistinctly punctate.

Long, 7 mm.
Laos; Xieng Khonang.

Menida vitalisana, sp. n.

Head and anterior area of pronotum shining metallic green, posterior area of pronotum and its narrow anterior and lateral margins

shining ochraceous or reddish ochraceous : scutellum pale ochraceous, sparingly punctate, a large transverse basal spot and a small marginal spot on each side before apex metallic green or pale blackish ; corium metallic green or purplish green, thickly finely punctate ; membrane greyish white : body beneath and legs ochraceous, somewhat thickly darkly punctate : antennae black, second joint somewhat short, third, fourth and fifth joints longer and almost subequal in length ; connexivum ochraceous with somewhat large metallic-green transverse spots.

Long, 8 mm.

Tonkin ; Chapa.

The British Museum Collection also contains a specimen from W. Yunnan collected by Dr. Anderson.

(To be continued.)

NEW FOREST NOTES AND CAPTURES, 1920.

BY HUGH P. JONES.

IN a season such as this last has been, when for weeks on end all active collecting was stopped by wet weather, it is rather a difficult matter to arrange material collected for this paper, any month-by-month treatment being out of the question. For instance, whilst March was a beautiful month, the heat in woods and enclosures here being that which is generally described as summer-like, bringing out spring Diptera and Lepidoptera much before their time, April's weather was just the contrary, cold winds and continual rain keeping back everything that was not already out and decimating those that were—e.g. *Euchloë cardamines*, which from being well on the wing by the beginning of April had almost disappeared by May, only a few stragglers surviving to enjoy the sun that eventually appeared, and continued, with dull intervals, until the end of June.

During this fine period insects were so abundant and forward that most entomologists anticipated a record season ; but alas ! it was not to last. It started to rain again in July, and kept on raining so heavily and continuously that when the sun shone again in August the woods were practically bare of insect life, a state which continued until about the middle of the month—too late, of course, for anything interesting to survive (although I was pleased to see *Dryas paphia*, var. *valesina*, in sufficient numbers to ensure continuity next season).

Limenitis sibylla, amongst the butterflies, suffered the most, being swept entirely away in some places, the greatest damage being done at Royden, where from being out in the greatest profusion towards the end of June not a single specimen was observed later, even *paphia* barely surviving here.

However, the early appearance of the former may have saved it for this part of the forest, for whilst collecting some full-fed

larvæ during the first week of June I saw a male flying, and a week later this sex was well out—possibly records for early appearances, and generally an omen of what is to follow.

August and September were, on the whole, fine, but insects were too affected by previous wet weather to be abundant, almost everything being a month behind time, so that October really took the place of September, the latter month actually producing freshly-emerged species that would, in the ordinary course, have appeared in July. (See list of Tabanidae.)

I give here a list of my various captures arranged in their natural order, which, under the circumstances, is the most convenient:

Hymenoptera aculeata: At the risk of being tedious I give these in full, recent records being much needed. It is a poor list, several families being entirely omitted through shortage of time and collecting weather, but, I think, better than none at all. Amongst the Bombidæ are some rather unaccountable blanks, certainly not due in their case to lack of observation.

Ants: I have done little with regard to naming these at present, not having sufficient types for a sure identification. *Formica rufa* was unpleasantly abundant at Rhinefield in May, beating the oaks bringing down hundreds at a time into the tray, the few lepidopterous larvæ that fell being at once seized upon. A pity the work of destruction was not done earlier to avoid extreme defoliation of the trees, but possibly even the ants in some years are outnumbered by the larvæ of such moths as *H. defoliaria*, *Tortrix viridana*, etc.! Larvæ of a species of *Microdon* (Diptera) were rather common in the nest of *Lasius* sp. ? (*fuliginosus*, without much doubt) at Aldridge Hill in July and August.

Mutilla: Neither *M. europaea* or *M. rufipes* were seen. Absence of the former scarce thing was perhaps to be expected, but I hoped to turn up the latter. Probably both occur.

Pompilus plumbeus was not uncommon at Milford, and *P. riaticus* very abundant on banks by the side of enclosures, etc., but other members of the family were scarce. *P. niger* was taken here and there from May to September, as also *P. gibbus* and *P. pectinipes*. I could not find *P. wæsmali*.

Salius fuscus (scarce at Setley), *S. exaltata*, *S. parvulus*, *Ceropales maculata* (Royden), *Astatus boops* (a few in a gravel-pit at Setley), *Tachytes pectinipes*.

Trypoxylon: All the three species. *Ammophila sabulosa*: Extremely abundant from June to September. A ♂ taken at Park Hill in June measures only 10 mm. across wings! *A. campestris*: Common locally, and evidently in some places out-numbers *sabulosa*, as in several dozen "sand wasps" collected for me all but two were this species. It is, of course, easily identified by the petiolated second submarginal cell and strigose

propodeum, but is markedly distinct in other ways, the ♂ having the abdomen almost black or deep plum-colour--an exaggeration of the black discal spot so characteristic of ♂ *sabulosa*. Also both sexes are of the same size, neither being so large as the average ♀ *sabulosa*, nor so small as some of the latter's males. For the last reason *campestris* can generally be distinguished on the wing.

Psammophila hirsuta: This fine thing did not appear this year until both of the former were almost over, i.e. towards the middle of September. Locally common. My last capture was made in the first week of October, and several females were seen later at Setley.

Psammophila lutaria was not seen on the coast here at the end of August, but might have been taken afterwards.

Pemphredon: Members of this family were scarce, and as most of the trunks and palings in the forest were sodden with rain I did not take a single *P. lugubris* or black *crabro*.

Diodontus: Once seen; probably *tristis*.

Mimesa: Only two specimens, which are probably *bicolor*. They were picked out from mixed wasps collected for me and pinned before determination, so that markings on *mesonotum* are difficult to make out.

Gorytes mystaceus (Royden) and *Hoplisus laticinctus* (Royden): A fine ♀ of the latter in July flying over a tangled mass of brambles, heather, etc. Wet weather spoiled the search for this species and *Nysson*, of which family none were seen.

Mellinus arvensis: Extremely abundant locally. At Setley it occurs in one gravel-pit commonly, but not once seen in another close by! Preys here on various *Tachinidae* (Diptera); on several occasions taken with the bright green *Pseudopyrellia cornecina*. Females are very fond of resting on leaves, especially bracken, probably in search of flies.

M. sabulosus I did not see on the coast here between Milford and Highcliffe.

Cerceris ornata occurred singly at places widely apart. *C. labiata* and *C. interruptus* both taken, but the fine *C. arenaria* not even seen.

Oxybelus uniglumis: Setley and elsewhere, but not common.

Crabro: As referred to under *Pemphredon*, I did not take any of the "black" species. *C. quadrimaculata* was not seen on any dead trunks, old posts, etc. The same may be said of *C. dimidiatus*, although both no doubt were present.

C. cephalotes, *C. chrysostomus* (Royden in September); a single ♀ *C. cibrarius* from G. Gulliver; *C. peltarius* (females not uncommon on banks at Norley Wood and singly elsewhere).

C. lituratus: One ♂ at Royden. *C. albilabris* did not appear.

Vespa: *V. crabro* not nearly so common as last year, and entirely absent at Royden, where the previous autumn it swarmed

at "sugar patches." *V. vulgaris* and *V. germanica* both at Lymington, but *V. rufa* is the wasp of the forest, whether heaths, gardens or woods. *V. sylvestris* and *V. norvegica* were both taken at Royden ("workers" only), but not seen elsewhere. Neither species can be overlooked.

Odynerus: Although continually working at this family I experienced very poor results. *O. spinipes* was fairly common on most banks in most woods, and when not seen its absence was probably owing to the "wood ant," but *O. melanocephalus* was not taken. The latter is more a hedge species. *O. callosus*, *O. parietum* and a few *O. trifasciatus*. *O. pictus* was not seen, and probably deserves the "not common" of Saunders. I have taken both this species and the preceding commonly in Cambridge gardens. *O. parietinus*: A single ♀ brought to me in September.

O. crassicornis: A female of this scarce species was taken in July during a short break in the rain flying round some bushes. Being almost certain of its identity directly I had it in my hand I tried hard for more, but wet weather set in again, so had no chance. Of its congeners only a solitary *O. sinuatus* was taken, but probably *gracilis* also occurs. The two common species, *O. callosus* and *O. parietum*, were brought to me in numbers throughout August and September on the chance that there might be some rarer species amongst them. Unfortunately this was not so!

Eumenes coartata: Not uncommon during September on heaths at Setley, but I could not find any "nests."

Bees: *Colletes succinctus*, *C. fodens*, and *C. dariesana*, *Sphecodes gibbus*, *S. subquadratus* and doubtful females.

Halicti: These little bees were unusually scarce. Out of those taken I have determined the following: *H. rubicundus*, *quadrinotus*, *prasinus*, *cylindricus* (I don't think any of these are *albipes*), *villosulus*, *nitudusculus*, *minutissimus* (a few at Norley Wood) and *morio*. *Leucopus* not found amongst few "green" ones taken. I was disappointed at not taking *H. xanthopus*.

Andrena: *A. albicans*, *floreæ*, *thoracica*, *fuscipes*, *julvicus*, *argentata*, *afzeliella* and *minutula*. A very poor lot, owing to the fact that I did no spring collecting for them. The beautiful *Dasypoda hirtipes* was not seen on the coast.

Panurgus calcaratus: Two from Mr. G. Gulliver; exact locality in forest uncertain.

Nomada: *N. solidaginis* was in the greatest abundance on all heaths. Whatever the host of this "cuckoo" I pity it! A few *N. roberjeotiana* were found at Setthorns, and other species taken were *N. sexfasciata*, *alternata*, *jacobææ* and *lathburiana*. With the exception of a solitary *N. furva* no others of the family were seen and I could not work for them in the spring.

Epeorus rufipes: Not uncommon where *colletes* was burrowing. A few *Cæloxyx* (*rufescens*, *elongata*) and *Megachile circumcineta*,

and *centuncularis*, *willughbiella* and *ligniseca* (the last from thistle-heads at Royden).

(To be continued.)

NOTES AND OBSERVATIONS.

DISAPPEARANCE OF AGRIADES CORYDON AB. SYNGRAPHIA FROM THE CHILTERN.—I have read Mr. Oliver's note on the disappearance of this beautiful form from its once favoured haunts in the hills about Cadsdene. I do not agree with the reasons he suggests for this disappearance, and I believe it myself to be due principally to the depredations of the reckless and callous collector. If not, all I can say is that the coincidence of this year's scarcity, if not actual extinction of the form, is more than remarkable. I have known the Cadsdene locality for close on five and twenty years. I have no doubt that I should have discovered the presence of ab. *syngrapha* (I can find no warrant at present for displacing Keferstein's name as demanded by Tutt, and the substitution of *tithonus*, Meig., as Meigen's description is not convincing) long before I did had I not almost invariably until 1913, I think, been abroad or out of reach of the Chilterns in August. I certainly did discover the form here—at all events, I was the first to publish it, though I left the immediate locality unspecified. Very bitterly do I regret that I ever did publish the second note when I had had an opportunity of visiting the spot at the right season. No one seems to have taken any notice of the original announcement ('Entom.', vol. xliv, p. 290), probably because it recorded a single specimen, and that late in the year—September 9th. It was in 1916 that I encountered the first net on the *syngrapha* ground. Owing to the war work in which I was engaged I had little time for observations, and my visits had been very few and far between. The net in question had secured twenty examples without effort in a single morning; and, as I anticipated, it was futile to expect that the little preserve, from which I had taken as many examples myself in as many years, would be secret to myself and a few genuine Nature-lovers much longer. My worst fears were realised in 1917, when the ground was overrun by dealers' collectors, and amateurs apparently drawn from all parts of the United Kingdom, and not engaged, I assume, in war work. I have reason to know that some hundreds of *syngrapha* were removed, in the majority of cases immediately on emergence, and, therefore, before they had been given the chance to pair and lay their eggs. Also the worst features of the Royston massacres were reproduced—the variety hunter netting every female, bottling them wholesale before examination, and leaving those rejected as normal dead or poisoned on the grass. The Royston ground is extended, the Chilterns ground but a patch. *Syngrapha* had become a commercial asset. It was, in my opinion, only a question of time how soon the place thereof would know it no more in sufficient numbers to make it worth while the annual invasion. I find the following entry in my entomological notes for 1917: "August 11th. Was disgusted to find people had been on the *syngrapha* ground apparently for a living. . . . Was informed that one collector had taken over 100 the previous day."

I saw but a ragged remnant, which no doubt fell victim to the next destroyer. Being on leave I revisited the scene on September 7th. Again I quote my diary: "A few still fresh female *corydon* about and very *passés* males. As the sun never broke out there was little flying, but curiously enough the one butterfly captured was *syngrapha* —a good example." Search of the grass bents revealed no more; but it is at least reasonable to argue that the form might have been over altogether at this date. We now come to 1918. I was away for the first half of August, and between July 30th and September 7th I found no opportunity to return to the Chilterns. On the former date I find from my diary: "I saw one *syngrapha* only: the species is not yet out in force, but I noted one gentleman already on the ground with a net the size of a coal-sack—big enough to intern the entire butterfly population of the Bucks Chilterns *per se*." On September 7th the slopes reminded me of a visit paid in 1907 to the famous *Plebeius zephyrus lycidas* ground below Berisal. Everywhere the grass, flowers, and down had the appearance of being manoeuvred over by a cavalry brigade. "I was surprised to find two absolutely fresh males. No trace of *syngrapha* . . ." The débâcle had been thorough—how thorough the experience of 1919 was to prove with lamentable conviction. With a view to determining the extent of collection in this locality I attended the meetings of the South London Society in November. The exhibits as usual on this popular occasion were many and various, but it was pitiful to see the cases crammed with the unfortunate *Corydon* "from the Bucks Chilterns"—some hundreds, and many of them typical or of such trivial departure from type that one wondered what they were doing in this gallery. I was not in the least surprised, therefore, when I read the report of the "Variety Exhibition" in the Society's "Proceedings," 1919–20, to find that, though exhibits included "many other interesting forms" from the Chiltern Hills. ab. *syngrapha* was not recorded among them. An extract from my diary reads: "August 15th. Back to Chilterns, but found the drought had accelerated everything, and all butterflies *passés*. The *syngrapha* ground trodden down. I watched two men with huge nets who never moved off the slope all day"—that is to say when I returned from a further investigation on the hills elsewhere, the same nets were still where I left them two or three hours earlier. Their *syngrapha* bag must have been meagre, for I noted ('Proc. S. London Soc.,' 1919–20), at the meeting held August 25th Mr. Newman reported "that *Agriades coridon*, on its usual habitat on the Chiltern Hills, was this year practically extinct, and that although collectors in abundance had frequented the locality in recent seasons, he did not consider the scarcity was due to over-collecting. In his opinion this was due to the attacks of ichneumons, for out of a large number of larvae of *A. coridon* collected in the spring more than 90 per cent. were attacked." Mr. Newman's conclusions were apparently based on his experiences, or that of his collectors on the *syngrapha* ground only. I agree neither with them, nor the reason he advances for the scarcity of the species. The same day (August 25th), in the course of my rambles not a mile from "the devastated area," I note "a lovely congeries of *corydon* males

over some droppings reminiscent of the alpine throngs," and further, on September 7th, when it may be assumed "the abundance of collectors" had decreased in volume, and the late emergences allowed some respite, despite the unfavourable weather a certain number of males and females—all typical—were observed in the same locality. It may be perfectly true that 90 per cent. of the larvæ collected hereabouts (?) were ichneumoned, but it will take much stronger evidence than that offered by Mr. Newman to convince me that the extinction of *syngrapha* was due to parasitic agency alone. Had not the hundreds of unimpregnated females been destroyed in the seasons immediately preceding 1919, it is reasonable to suppose that the balance of Nature would have been maintained. Mr. Newman says that his experience at Royston was much the same as in this part of the Chilterns. But whereas this year (1920) there appears to have been no such wholesale falling off in that locality, my experience of the *syngrapha* ground is in effect exactly the opposite. If left to itself—and I fear this is too much to expect—it may be that a few *syngrapha* have evaded the net, professional and amateur, and will in time revivify the race. I am assured that a tendency to maleness in a local form, provided the type is allowed to exist, cannot be altogether eradicated by the extermination of the local form in question. May it be so, but for the present it is quite clear that indiscriminate collection threatens to destroy, if it has not actually killed, the goose that lays the golden egg. I have written these notes, therefore, to urge upon dealers and amateurs alike, not merely the unwisdom of their attacks, but in the hope—perhaps that is rather too sanguine a word—that *A. corydon syngrapha* in this little angle of its distribution may be left alone for a few years, if it be ordained to work out its own salvation. As it is, it seems to have suffered "the common fate of all things rare," and to have realised prematurely, and to the grief of all true lovers of nature.

"How small a part of time they share
That are so wondrous sweet and fair!"—

H. ROWLAND-BROWN: Harrow-Weald, December, 1920.

BUTTERFLIES IN SOUTH BUCKS, 1920.—The following short notes on butterflies observed in South Bucks this season may be of interest: *Euchloë cardamines*: Not nearly so abundant as usual. *Colias edusa*: Abundant on the Chilterns. *Gonepteryx rhamni*: Not so abundant as usual in the summer, but abundant in the spring. *Limenitis sibylla*: Though I captured one specimen in 1919 I was unable to re-discover this butterfly this year. *Eugonia polychloros*: I have never met this butterfly here, with the exception of one doubtful specimen flying high. I should be glad to know if other readers have encountered it in S. Bucks. *Aglais urticæ*: Abundant. *Vanessa io*, *Pyrameis atlanta*: Both very abundant. *P. cardui*: A few seen. *Dryas paphia*: Not abundant. *Argynnис cydippe*: Abundant. *A. aglaja*: Very abundant and variable. *Brenthis euphrosyne*: Abundant. *B. selene* I have never met with. *Melitaea aurinia*: One specimen near Risboro'. *Melanargia galatea*: Very abundant on the Chilterns. *Pararge egerides* and *P. megaura*: Very abundant. *Epinephele tithonus*: Not nearly so abundant as usual. *Aphantopus*

hyperanthus: Abundant and very variable. *Cænonympha pamphilus*: Abundant and variable. *Zephyrus betulae*: One only seen but not captured. *Z. quercus*: Extraordinarily abundant, but elusive. *Callophrys rubi*: Very abundant on the Chilterns. *Chrysophanus hæas*: Not so abundant this year. *Aricia medon*: Abundant everywhere. *Agriades corydon*: Very abundant; no extreme variations observed, the commonest blue. *Celastrina argiolus*: Not so abundant as usual. *Cupido minimus*: Abundant on the Chilterns. *Iemeobius lucina*: Very abundant on the Chilterns. *Hesperia malvae*, *Isoniades tages*, *Adopæa flava*, *Augiades sylvanus*: All everywhere abundant. *A. comma*: Not so abundant as usual.—WALTER PIERCE: High Wycombe, Bucks.

BUTTERFLIES OF VENTNOR, 1920.—The following is a list of butterflies, all actually netted, not merely seen, within a three-mile circuit of Ventnor, Isle of Wight. Abundant: *P. rapæ*, *P. atalanta*, *L. cinxia*, *M. galatea*, *P. megæra*, *E. jurtina*, *E. tithonus*, *C. pamphilus*, *C. rubi*, *A. corydon*, *A. bellargus*. Common: *P. brassicæ*, *P. napi*, *E. cardamines*, *C. edusa*, *A. urticæ*, *V. io*, *P. cardui*, *A. aglaia*, *H. semele*, *Z. quercus*, *C. phœas*, *P. icarus*, *A. medon*, *minimus*, *H. malvae*, *N. tages*, *A. flava*, *A. sylvanus*. Scarce: *rhamni*, *L. sibylla*, *E. polychloros*, *D. paphia*, *A. cydippe*, *euphrosyne*, *P. egerides*, *A. hyperanthus*, *P. argus* (*ægon*), *C. argiolus*. The season was a very bad one, so that the list, which includes thirty-nine species, flatters it immensely. Day after day passed without a respite of the sun. On the few really favourable days insects certainly warmed on the downs and by the coast, but for some remarkable reason seemed to shun private gardens. *Melitæa cinxia* larvae were out of winter quarters and feeding at the end of January, and thanks to a mild February had all pupated by end of April. This insect is certainly gaining ground inland: I found larvae quite commonly near Wroxall, two miles from the sea. *Colias edusa* was scarce in spring, but common in August. Four var. *helice* were taken and one or two more missed. One sad event takes a great deal of erasing from the memory. This was a chase after *C. hyale*, and in the long, stern chase to a barbed wire gate separating us from a lucerne field we beat the net by about 6 inches. There would have been a better ending twenty-five years ago! I have not included *hyale* in my list, as although certain as to its identity myself some may consider I mistook *helice* for it. By far the best thing taken was *tithonus* ab. *albida*, as previously recorded (*antea*, p. 210). Many interesting notes were made, but to mention them here would occupy too much space.—ERNEST CORNELL: "Burmah," Newport Road, Ventnor.

HELIOTHIS PELTIGERA AND PHRYXUS LIVORNICA AT VENTNOR.—An entomological friend of mine, Mr. C. J. Pollard, was fortunate enough to take a pair of *H. peltigera* on May 17th flying at dusk over a wallflower bed at Ventnor. Mr. Pollard was also lucky enough to find a dead specimen of *D. livornica* in a doorway on July 13th. It was minus both antennæ, but otherwise in fair condition.—ERNEST CORNELL: "Burmah," Newport Road, Ventnor.

ON SCOPARIA ULMELLA.—In my 'Handbook' I treated *ulmella*

as a form of *ambigualis*, and it is also so treated in Staudinger's catalogue. Mr. J. C. Hayward has been good enough to send me for inspection his series of 14 specimens of *ulmella*, taken on trunks of wych-elm at Repton, where he finds it very local; it appears in July after *ambigualis* is over. This excellent material has enabled me to ascertain that *ulmella* is without doubt a good species. The character most easily apprehended is in the two posterior cloudy white lines (second and subterminal) of the fore wings, which in *ulmella* are confluent or close together throughout, whilst in *ambigualis* they are separated by considerable spaces of ground colour towards costa and below middle. Additional distinctions of *ulmella* are the rather smaller size, the more strongly and evenly curved first line, the different form of the second line (which in *ambigualis* makes a characteristic angle above middle, whilst in *ulmella* it is evenly rounded at this point), and the more whitish (less grey) hind wings. Fortified with this knowledge I was able to detect a specimen of *ulmella* in my series of *ambigualis*, taken by myself at Ramsbury on July 10th, 1887, whereas my latest date for *ambigualis* is July 2nd. The insect will therefore probably be found widely distributed but local. I hope that Mr. Hayward will now shortly discover the larva.—EDWARD MEYRICK; Thornhanger, Marlborough January 5th, 1921.

NOTE ON BRETON EPINEPEHELE JURTINA.—I find that in my paper on "August Butterflies at Lannion" ('Entom.', vol. liii, p. 277) omitted to record an ab. of *E. jurtina*, ♀, which approached the South European form *hispulla*. The fore wings with the exception of the outer margin were completely fulvous, the bases being tinged with brownish; there was also a distinct fulvous band on the hind wings. I took the insect at Trestrignel, August 6th, 1920. *E. jurtina* ab. *tineta*, Blackie, is practically speaking synonymous with ab. *alba* Blackie. I therefore wish to sink the former name.—JOHN E. H. BLACKIE: The Vicarage, Windsor.

LAMPROPTERYX (CIDARIA) OTREGIATA IN SOUTH DEVONSHIRE.—I think I ought to record the capture of *Cidaria otregiata*, second brood, which has been kindly identified for me by the Rev. J. W. Metcalf, in a locality near Dawlish in South Devon, in August, 1920.—A. R. HAYWARD: Mount Radford, Misterton, S.O., Somerset.

MELANIC EUPithecia LARICIATA FROM CHESHIRE.—Last May bred a short series of *E. lariciata* from larvae I had beaten in 1919 from a small fir wood in which there are a few larches. Three of them were pure melanic specimens similar to those occurring at Sutton Coldfield. Last August I again beat a few larvae (they are far from common), and hope to breed the melanic form again this year. The wood is about half a mile from Alderley Edge.—B. E. CRABTREE: Holly Bank, Alderley Edge, Cheshire, January 3rd, 1921.

ABRAXAS GROSSULARIATA, SECOND BROOD.—I took a ♂ flying in thick fog at Barnes on the morning of October 21st, and saw another at the same place on October 28th. On the latter morning at Putney I found larvae in all stages, hibernating to full-fed.—H. WORSLEY WOOD: 31, Agate Road, Hammersmith, W.

XANTHORHOE SOCIATA IN NOVEMBER.—A ♀ taken drying her wings at Putney on the morning of November 28th last.—H. WORSLEY WOOD.

IODIS LACTEARIA LARVÆ HIBERNATING.—About a dozen larvæ beaten from oak on Wimbledon Common on September 15th continued feeding for about a week until nearly full-fed, since when they have refused all food, and though lively if disturbed have evidently settled down for hibernation. Has this tendency been noted before?—H. WORSLEY WOOD.

SIREX GIGAS IN A CLYDE SHIPBUILDING YARD.—*Sirex gigas*, the Giant Wood Wasp, is well known to entomologists as a wood importer. We find this species of Siricidæ in a variety of situations. Gillanders in his 'Forest Entomology' tells us that the best consignment of *S. gigas* he ever received was sent to him by a miner, who found the insects issuing from the pit-props. Carpenters not infrequently find the Wood Wasp when sawing the coniferous trees. The life-history of *S. gigas* is most interesting indeed. Dr. Sharp says that large numbers of these insects emerged from wood, which had been imported from Canada, in a house twenty years after the house had been built. There are numerous other records, in a large shipbuilding yard on the Clyde *S. gigas* aroused great interest. During the last week of July and in the first week of August they emerged from their pupæ in the high "uprights" by which the scaffolding is held, and were found clinging to the bark. All the specimens I reserved from these coniferous, usually larch or pine, "uprights" were in perfect condition; I have a ♂ as small as 1·5 in., and another almost 2 in. long from tip of head to end of the long, thin ovipositor. The ♀'s were all alive when I got them and were in excellent condition. The ♀'s especially aroused great interest, and the glistening bands of black and yellow, the long filiform antennæ, the wide, clear wings and the slender ovipositor all combine to make *S. gigas* seem, at least to the uninitiated, to resemble the hornet. The ovipositor was popularly supposed to be a sting. It is probable that these "uprights" were imported from the great pine forests of northern Europe, where *gigas* is a veritable pest. As far as I could ascertain no *juvencus* were found.—ALEXANDER CUTHBERTSON; Hazelbank, Dumbartonshire, November 10th, 1920.

VESPA IN 1920.—In the November 'Entomologist' Mr. C. Nicholson draws attention to the scarcity of wasps in the south of England this summer. Now I have found the reverse to be the case in Western Argyll. In this locality wasps were very plentiful in September, and I noticed them particularly at Ballachulish, Kilchiaran, Crinan and Tarbert (Loch Fyne). At Crinan the wasps were troublesome that the visitors at the hotel searched out some nests and destroyed them.—A. STEVEN CORBET; 32, Hamilton Road, Dalding.

VESPA IN 1920.—In reply to Mr. Nicholson's query, wasps were usually abundant in this neighbourhood during September. Several hundreds entered one of my hives in a single hour, and a good many weakened stocks of bees were destroyed by them. On the other

hand, I saw hardly any wasps at all on the Norfolk Broads this year. They were becoming abundant on sugar near Brockenhurst as early as July 2nd.—C. MELLOWS: Bishop's Stortford College, Herts.

SCARCITY OF VESPA.—On p. 264 of last volume I mentioned a strong nest of *V. germanica*, and it may interest readers to know that I took that nest on October 24th last. It was in the clay bank of a small pond in a rather frequented place near here, and I had kept it under observation for some weeks waiting for a favourable opportunity. I chose a Sunday morning, and sallied forth just after 7.30 in order to avoid publicity as far as possible. In this I was successful, for the morning was a little misty and very sharp, there being thick hoar-frost on the grass and foliage. On arriving at the pond I was much surprised to find about a dozen workers clinging to the bank immediately round the entrance hole to the nest cavity in spite of the sharp frost, most of them looking numbed with the cold, but seven at least were vibrating their wings and crawling slowly about as if to get up their circulation! On my touching a small nodule of clay which partly blocked the entrance three other workers rushed smartly out and at once attacked me, but fortunately they struck my coat and did no harm. I at once injected a little cyanide, stopped the hole with a rag, and strolled round a bit to keep my own circulation going. On returning in about ten minutes I at once proceeded to remove the front of the bank and found the nest just inside, a thickness of 2 in. of clay only intervening between it and the outer world. I was struck with the few wasps visible inside, as the warmth of the nest cavity was very noticeable when I inserted my hands to lift out the nest, which was as large as a Rugby football. The bottom of the cavity consisted of large pebbles mixed with the usual wet mass of greyish mud and dipterous larvae, but as the latter seemed to comprise only *Volucella pellucens* and some small "muscids" I did not waste time over them. On reaching home the nest was installed in a box and covered with a sheet of glass and some perforated zinc, giving forth in the course of the next week no less than some hundreds of queens, drones and workers.—C. NICHOLSON: Dale End, Chingford.

SOCIETIES.

SOUTHAMPTON AND DISTRICT ENTOMOLOGICAL SOCIETY.—Meeting held Tuesday, September 21st, 1920, at 47, Tennyson Road, Southampton. This was the first meeting held by the Society. Mr. Fassnidge, M.A., having just arrived back from France after several weeks spent in studying the Lepidoptera of that country, gave a very interesting lecture on his experiences. He illustrated his lecture by means of specimens he had collected, chiefly around Dijon, including living larvae of *P. machaon* and *P. podalirius*.—Mr. F. J. Killington exhibited a remarkable series of the beetle *Elater sanguinolentus*, including one with the red replaced by yellow, and a series, showing great variation, of *Strangalia armata*; also the larva of *Nisonia* (*Thaumos*) *tages* hibernating in a box.

October 5th, 1920.—Mr. F. J. Killington gave a paper on the Odonata of the district and exhibited a large number of preserved

specimens by way of illustration. Mr. W. Fassnidge read a paper on the larval habits of *Limenitis sibylla*, and exhibited the larva in its hibernaculum, the preserved pupa (*in situ*), and a series of imagines. It has been his experience that the larvae are found on the poorest plants of honeysuckle and always those against some substantial support such as an oak tree. The same gentleman read notes on the larval habits of *Pyrameis cardui*, a species that has been unusually abundant in the district this year.—Mr. B. Hobby, the dragonflies *Ischnura elegans* (orange form) and *Culopteryx splendens*, both taken in Paris this year.—Mr. E. Hayward exhibited a nice collection of "Click" beetles, and presented a number of species to the Society.

October 19th, 1920.—Mr. W. Fassnidge, M.A., gave a paper, the first of a series, on the classification of the Lepidoptera. He dealt thoroughly and lucidly with the different systems, and showed how each served a useful purpose. A paper of this nature naturally led to much interesting discussion at its close.—A paper by Mr. E. Hayward followed, also the first of a series, and dealt with the study of the Coleoptera. A great feature of this paper was the exhibition of a number of ingenious pieces of apparatus devised and made by the lecturer. An exhibition of beetles concluded the lecture. The species shown were: *C. polita*, *C. aureolus*, *P. alneti*, *A. coryli*, *A. curculionoides*, *N. melanura*, *B. glandium*, *B. tessellatus*, *O. tenebricosus*, *O. picipes*, *O. coryli*. A small collection of beetles was presented by the lecturer to the Society.

November 16th, 1920.—Mr. J. E. Eastwood, of Havant, and Mr. G. W. Pierce, of Ousslebury, Winchester, were elected members.—Mr. W. Fassnidge continued his paper on the Lepidoptera, this time dealing with the egg. Discussing first the question of parthenogenesis, he explained that while many records of this phenomenon were undoubtedly due to faulty observation, yet it was a fact that certain Lepidoptera laid ova, without previous sexual union, that produced larvae and later imagines, and among other examples mentioned *B. mori*. In southern France, where the silkworm is bred, and the stock degenerates from time to time owing to inbreeding, re-invigoration is brought about by this means. The various types of eggs, their structure, the parasitical Hymenoptera that attack them, copulation and fertilisation were all exhaustively dealt with. Photographs and actual specimens of eggs illustrated a very interesting paper.—Mr. E. Hayward also gave the second part of his paper on the Coleoptera, and this time took the sub-order Adephaga as his subject. An exhibition of various species by the lecturer at the end of his paper concluded a most interesting evening.—FREDK. J. KILLINGTON, Hon. Sec., 68, Archer's Road, Eastleigh.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt St., Liverpool, October 18th, 1920.—Mr. S. P. Doudney, President, in the Chair.—This being the opening meeting of the session, it was devoted to an exhibition of the season's work.—Mr. S. P. Doudney showed—*Papilio machaon*, *Nonagria arundinis*, *Arsilonche albovenosa*, *Scita maritima*, *Acontia luctuosa*, and *Bankia argentula* from Wicken. *Macaria notata*, *Eupithecia plumbeolata*, *Lobophora halterata* and *Melanippe hastata* from

Burnt Wood. *Argynnис cydippe* from Arnside. *Plebius aegon*, *Cænonymphа tіphon* and *Carsia paludata* from Holker.—Mr. W. A. Tyerman brought Lepidoptera from Tan-y-Bwlch, North Wales, including *Brenthis selene*, *Ino statices*, *Emmelesia adæquata* and *Acidalia subsericeata* and a fine bred series of *Tephrosia biundularia* var. *delamerensis* from Llangollen.—Mr. R. Tait had spent his holiday at Wicken and exhibited from that locality nice series of the following: *Leucania pudorina* and *L. straminea*, *Agrotis obscura*, *Calymnia affinis*, *Epunda criminalis*, *Aplecta advena*, *Lithosia griseola*, *Acidalia emarginata*, also specimens of *Cymatophora octogesima* and *Arsilonche albovenosa*.—The Rev. F. M. B. Carr had a specimen of *Hespera malvae* from Delamere, this being a new record for Lancashire and Cheshire, also a specimen of *Argynnис cydippe*, a species which had not been recorded for Cheshire for many years, although common in North Lancashire. Other interesting species in Mr. Carr's exhibit were: *Xanthia gilvago*, Chester; Some very dark *Oporabia dilutata*, Alvanley, and fine varied series of *Noctua glareosa* and *Himera pennaria* from Delamere Forest.—Mr. S. Gordon Smith showed long and varied series of the following: *Dryas paphia* from the New Forest, including var. *valesina* and aberrations of the male with the terminal black spots wedge-shaped; *Melanurgia galatea* from Market Risborough; several nice aberrations of *Aglais urticæ*, bred from Prestatyn larvae; from Delamere, two fine aberrations of *Cymatophora flavigornis*, a fine varied series of *Nyssia hispidaria*, including quite black forms, and a series of *Noctua neglecta* var. *castanea*. By using electric light at Chester Mr. Smith had added *Halia brunneata* (?) to the Lancashire and Cheshire List; by the same method he had also taken a fine black variety of *Acronycta alni*; he also showed a fine aberration of *Odonestis potatoria*, a female having normal male colouring.—Mr. W. Mansbridge exhibited two examples of *Cænonymphа pamphilus* from Crosby sandhills which were without the usual black spot on the forewings, also four specimens of *Sarrothripus rerayana* from North Lancashire.—Mr. H. B. Prince had a box of *Agriades bellargus* from Kent, which included some good under-side aberrations.—W.M. MANSBRIDGE, Hon. Sec.

RECENT LITERATURE.

Les Insectes. By C. HOULBERT. Second Edition. Pp. 374, 207 text-figures. Paris: Librairie Octave Doin, 1919.

Published as an introduction to the study of the biology of insects. The author devotes most of his space to anatomy and physiology, comparing the variations in structure and function of the homologous parts throughout the Orders, and deals briefly with reproduction, development, etc., but adds chapters on geographical and geological distribution, economic entomology, a short bibliography, and gives an interesting *r'sumé* of the history of the science. Throughout he makes plentiful reference to the works of others, and has produced a sound elementary work of wide scope, which will probably be of most use to English readers as a means of getting a knowledge of French entomological terminology. N. D. R.

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SOME NOTES ON REARING *EREbia epiphron*.

BY THE LATE J. ALDERSON.

[The following paper was placed in my hands by the late Mr. Alderson for inclusion in my then contemplated monograph of *Erebia epiphron*. The late Mr. Tutt had evidently intended it for his never completed "Natural History of British Butterflies" (cp. *Ent. Record*, vol. xviii, p. 265).—H. R.-B.]

The ova were laid by a ♀ taken at Honister Pass on July 1st, 1906, by my friend Mr. George Wilkinson of Workington. The insect was *in cōp.* when captured, and Mr. Wilkinson boxed both the ♂ and the ♀ in one pill-box, and sent the box to me by post. Both insects were alive when I received them, and the ♀ had already commenced ovipositing, undeterred by its confined conditions or the presence of the ♂.* About forty ova had been laid, chiefly on the sides of the box; a few were attached to the top and bottom of the box, and others were unattached. I took the ♀ out of the box and placed it with some cut blades of grass in a tumbler, the mouth of which I covered with leno. The insect very soon commenced ovipositing on the grass blades. I placed the tumbler outside on the window-sill, in such a position that the insect would get sunlight, but not the direct rays of the midday sun. Sunlight, however, did not seem to be a necessary factor in the process of egg-laying, for oviposition took place both when the sun was shining and when it was obscured. On the first day of the insect's confinement in the tumbler about fifteen ova were deposited on the grass-blades; about twelve were laid on the second day, and only three or four on the third day. I had fed the insect each day, but on the third day after its arrival it seemed to have little strength left, so I placed it in the cyanide bottle. One or two of the ova had been deposited on the leno covering of the tumbler, and the remainder were laid on the blades of grass. On several occasions I watched the process of oviposition. Before depositing the egg, the insect, clinging to the grass-stems, incurved her abdomen, often to an extreme degree, and felt about with the tip of the abdomen among the blades of grass for a suitable position in which to place the ovum. On one

*It is a very easy butterfly to get ova from. I find the ♀ generally lays a few eggs in the pill-box.—G. W.

occasion the tip of the abdomen, while feeling about in this manner for a grass-stem, came in contact with one of the insect's legs, and, much to my surprise and amusement, she immediately laid an egg on this leg. I brushed off the egg, and it stuck to a blade of grass.

The ova are canary-yellow in colour when first laid. I did not take any note of the ovicular colour changes which preceded the emergence of the larvæ, and although I noted down the date of larval emergence, I regret to say that I mislaid this note. I cannot say how many days were passed in the egg state.* When the larvæ emerged I was quite at a loss with regard to a food-plant, for I was not acquainted with *Aira præcox*, *Deschampsia cæspitosa*, *D. flexuosa* or *Nardus stricta*, which appeared to be the favourite food-plants of this larva. I tried the larvæ with *Juncus* and with one or two species of grasses growing on the commons hereabouts, but none of these was eaten. As a last resource I tried some grass growing in the garden, which, by the way, was the same on which the ♂ butterfly had oviposited in the tumbler. I was very pleased to see the larvæ commence feeding at once on this grass, and this afterwards formed their sole food-plant. I did not at first know what species of grass this was, but subsequently I learned from Dr. Chapman that it was *Poa annua*, and this, of course, is mentioned by several authorities as a food-plant of *E. epiphron*. While the larvæ were small I confined them in glass-topped metal boxes, and these kept the cut grass fresh for a day or two. As the larvæ grew in size I adopted the rearing methods detailed by Dr. Chapman on p. 74 of Pt. II of "Practical Hints for the Field Lepidopterist." I used several tumblers, and placed about six or eight larvæ in each tumbler. On the bottom of each tumbler I put a piece of blotting-paper cut to fit exactly, and under the lid I fitted another piece of blotting-paper. The lid of the tumbler consisted of the glassed-topped lid of a 3½-in. metal box. The tumblers were cleaned out and the larvæ given fresh food every alternate day. Under this plan the grass kept fresh and the blotting-paper absorbed any undue moisture. To change the air in the tumblers and prevent it becoming noxious, I took off the lid of the tumblers once or twice daily and waved the tumbler backwards and forwards in the open air. The larvæ were all kept under the same conditions in a small outhouse which had a southerly aspect. The door of this outhouse was kept open, and the tumblers containing the larvæ were placed on a shelf just within the door. The larvæ were thus sheltered from the sun's direct rays and from inclement weather, while the temperature would approximate to that of the open air. Under these conditions the larvæ fed up well and steadily; but by mid-August four had outstripped their fellows being much larger and feeding greedily, while the rest were

* Eighteen to twenty days is correct.—G. W.

eating very little. This led me to expect an autumnal emergence, though I had not heard of it being recorded in connection with *E. epiphron*. At the end of August one larva laid up for pupation, and assumed the pupal state on September 2nd; from this pupa a ♀ insect emerged on September 11th. A second larva pupated on September 9th, producing a ♂ imago on September 28th. A third larva pupated on September 16th. I sent this pupa to Mr. Main for photographic purposes, but it probably received some injury while travelling, as it died soon after arrival. A fourth larva pupated on September 18th, and produced a ♀ insect on October 5th. It will thus be seen that the first insect passed nine days in the pupal state, the second nineteen days, and the third seventeen days. This variation was probably due to the difference in the temperature between September 2nd (the first date of pupation) and October 5th (the last date of emergence).

At this stage the remainder of the larvæ were (and had been for some weeks) feeding very little, and were about $\frac{5}{16}$ to $\frac{3}{8}$ in. in length. On October 18th I placed two of the larvæ in a glass-topped metal box, and put this on the kitchen mantel-piece in order to see whether the increased warmth would induce them to feed up. I kept them there for about a fortnight, but these larvæ ate no more during this period than they did under normal conditions, so I did not carry the experiment further. By the end of October the remaining larvæ were feeding very little, and as I had been losing several about this time by the method of close-rearing in tumblers, I decided to alter the treatment and keep them under more natural conditions during the winter. My stock of larvæ had now been reduced to eighteen, and on November 1st I placed these on some *Poa annua* which I had growing in a flower-pot. I confined the larvæ by means of a glass cylinder with a leno covering to the top, and placed the whole in the garden in the open air. The larvæ took up their positions on the grass-stems, and moved about very little, and then only in mild weather. In early January I made a close search for the larvæ; I found several dead ones, but only one living one, so, although others may be hidden at the roots of the grass, I have little hopes of being able to carry any beyond the hibernating stage.*

I must here express my regret that I did not take careful notes with regard to the larval habits and the different larval changes, and that the larvæ were not in hands more competent to work out the full life-history of this species. The few notes that I offer with regard to larval habits, etc., are jotted down entirely from memory, and will, I am afraid, possess little value.

Except at its first instar, the larva throughout is of a bright grass colour, assimilating perfectly to the green blades of *Poa annua*. It is, on this account, difficult to locate even in the

* None of these passed the hibernating stage.—J. A.

confined area of a tumbler, especially as its resting attitude, its shape, and the longitudinal lines along its body all serve to render it less conspicuous. It rests almost invariably with its body fully extended and closely pressed to the edge of a grass-blade. The body of the larva tapers at both extremities, thus forming a curve which reaches its highest point about the middle segments, so that when the larva assumes its resting attitude on a grass-stem there is no abrupt break to catch the eye in the outline of the blade of grass beyond a gentle swelling where the larva is resting. The larva feeds during the day, and occasionally I have seen it feeding by night, but my observations were not close enough to enable me to state with any certainty whether it is an habitual night-feeder. When feeding, the larva clasps the edge of a grass-blade and eats into the blade, working downwards, and seldom eating beyond the midrib; but occasionally the blade of grass is eaten right through. Mr. Tonge's excellent photo. of the larva admirably illustrates the attitude it adopts when feeding; this photo. was taken in September, and shows the hibernating size of the larva, for none (except the four that pupated) moulted again after mid-August. I cannot remember the exact date of the last moult before hibernation, but certainly it was not later than this. The point that struck me most with regard to the habits of the larvae was their extreme lethargy. All their movements were performed with the utmost deliberation. It was very seldom I observed one on the move, either by day or by night, and when they did move the process of travelling appeared most laborious and painfully slow. The only time a larva was at all restless was when it was full-fed and was apparently searching for a suitable place for pupation. At this period the larva travelled all round the tumbler, climbing up and down the grass-blades in search of a suitable place. This restlessness lasted from one to two days, I believe, but I cannot be certain of the exact time. In the four cases in which pupation took place, the larvae, after all their wanderings, settled down for pupation in practically identical situations. In each case the position chosen was on the blotting-paper that covered the bottom of the tumbler, amongst the bases of the grass-stems. Here a few strands of silk were spun apparently at random amongst the grass-stems. The amount of silk used by the four larvae varied, but I do not think that at the most more than a dozen strands were spun by any of them; in one instance I was under the impression that no silk had been spun, but as my observations had been only cursory, it is quite possible that the silk (if any were spun) might have escaped my notice. However, I can say that in these four instances of pupation the puparium was of the slightest possible description—so slight, indeed, as to give the impression that it is but the faint remaining trace of a former well-developed habit. I cannot definitely say that all the pupa-

possessed an anal attachment, but when turning one of the pupæ out of the tumbler I noticed that it hung by the anal segment by a strand (or strands) of silk. My impression is that all the pupæ were not so attached, and in any case the attachment was but slight. In all four cases, as I have noted above, pupation took place at the bottom of the tumbler, and in all four cases the larva, during the change to the pupal state, was touching, if not actually resting on, the blotting-paper; after the change the pupa was resting on the paper, and did not depend on the strands of silk for its support. In three instances the larvæ went through the process of pupation with the dorsal surface on the blotting paper and the ventral surface uppermost; but in the fourth instance the position was reversed, and the ventral surface of the larva remained throughout on the blotting paper. After the puparium had been spun, the larva remained quiescent for some time preparatory to the change to the pupa. I am under the impression that one day was occupied in making the puparium and settling down for pupation, and that about two days were passed in the quiescent state; but this is a point upon which I cannot speak with any certainty. Nor can I say anything with regard to the operation of changing or the time thus occupied. The larva retains its green colour throughout, and the newly-formed pupa is of a bright transparent green, this colour, of course, not retained throughout the whole pupal state, but little change can be detected for some days, the only difference being that the colour gets slightly duller and less transparent. Dr. Chapman's description of the fourth pupa* was made when it was four or five days old; it may be well to mention also that this pupa produced a ♀ imago, and that Mr. Tonge's photograph shows the same pupa, for this pupa was more dumpy than that which produced the ♂ imago.

I kept the fourth pupa under observation, and took some notes of the changes in colour which preceded emergence. On September 30th I observed the first decided change in the appearance of the pupa. A distinct, though not striking, change in coloration had taken place between the date of pupation (September 18th) and September 30th, the green colour having lost in brightness and intensity and the pupa being altogether of a much duller appearance, but this change had been so gradual that, until September 30th, it was not possible from one day to another to observe any perceptible difference in the colour of the pupa. On September 30th, however, the appearance of the pupa showed a distinct advance on that of the preceding day. I will give the notes as I took them down, commencing with the date that showed the first decided change in the appearance of the pupa.

September 30th, forenoon : The eyes have assumed a brownish tint; there is a slight darkening about the mouth-parts. The

* Not with MS.—H. R.-B.

wings are fading from green to a creamy colour, and the brown linear markings on the wing-cases seem more intense, but this intensity is probably more apparent than real, owing to the lighter ground-colour of the wings; the dark central thoracic line also appears to have gained in intensity. The green colour of the abdomen shows little signs of change.

October 1st, forenoon : The eyes are of a more pronounced brown ; the mouth-parts are much darker than they were the previous day ; the wings are now of a creamy colour, and have quite lost any trace of green. A dark shading appears on the thorax towards the head, and the dark line down the centre of the thorax is much more pronounced ; a change also appears in the abdomen, which is now of a greenish-white colour.

October 2nd, midday : The wings are now of a buff colour, tending towards a faint brown over their central area ; the dark shading has now fully occupied the thorax, and is extending to the abdomen. The dark line down the centre of dorsal surface of abdomen is much more intense, being almost black on the fourth, fifth and sixth abdominal segments. The appearance of the pupa is now quite changed from that of three days ago : the only indication of green (a faint greenish-yellow) that can now be observed is on the abdomen, being most pronounced on the sides, while the deepest shade of brown is in the region occupied by the mouth-parts, legs, etc.

October 2nd, midnight : The wings are of a decided brown colour, deep enough to obscure the linear markings on the wing-cases, the central area of the wings being much darker than the margins. The dark shading on the thorax is now so intense that the central dark line is almost unnoticeable. The antennae attract attention owing to their being slightly lighter than the colour of the surrounding parts ; the abdomen shows little further change.

October 3rd, 10 a.m. : The wings are now of a very dark brown colour ; the fulvous area on the fore wings shows very clearly through the pupal casing, and the black dots within this area can easily be made out. The dark line down the centre of the thorax is still discernible, and along this line rupture takes place during dehiscence. Except in the abdomen, which is the last part of the pupa to undergo change, there is little further difference in the appearance of the pupa. Change in the abdomen is taking place from two centres, and consists of the dark shading before mentioned ; one of these centres is the dark line down the centre of the dorsal surface, and the other is a similar dark central line down the ventral surface of the abdomen. These lines, which are most pronounced, are gradually increasing in area, the dark shading fading off laterally ; the abdomen therefore shows lightest on the sides, and is here of a drab colour with only the faintest suggestion of yellow.

October 3rd, 2 p.m. : The dark shading has now occupied the

whole of the abdomen; it is slightly lighter on the sides, and reaches its deepest shade along the dorsal and ventral abdominal lines; beyond this there is no further change in the pupa.

October 3rd, midnight: The colour of the abdomen throughout is now as deep as, and similar to, that of the thorax, and the ventral and dorsal abdominal lines are now unnoticeable.

Between this last observation and the date of emergence there was no appreciable difference in the appearance of the pupa. To sum up the appearance of the pupa: at this stage the wings are of a dark brown colour, with the markings on the fore wings showing clearly through the pupal casing; the thorax and abdomen are of a different shade, tending more towards a dark sepia shade, or wood-louse colour. The two different shades (that of the wings and that of the thorax and abdomen) are reached, as I have shown in the above notes, through two different processes. In the former the brown is evolved through a fading of the green to cream, then cream to buff, and finally buff to brown; but the dark coloration of the thorax and abdomen is attained in a different way; in these parts the first change consists of a faint dark shading (almost suggesting decomposition of the subjacent area) showing through the green; this shading, absorbing all the green colour, gradually gains in intensity and opacity until it reaches a dark sepia or wood-louse colour. The colour of that part of the pupa occupied by the mouth-parts, legs, etc., is a blackish brown. The eyes, which are the first part of the pupa to show any signs of darkening, are a this stage, with the exception of the antennæ, lighter in colour than any other part of the pupa. In the mature pupa there is a very faint suggestion of a whitish powdering, more noticeable about the interstices of the abdominal segments.

I noticed the first change in the appearance of No. 2 pupa—the fading of the wings and the darkening of the eyes—on September 23rd, five days before emergence, which is identical with that of No. 4 pupa. I did not take any notes regarding the pupal changes in No. 1 pupa, but I have the impression that the change and emergence covered much less time than was occupied by the other two pupæ, and as the first pupa remained only nine days in the pupal state, which is probably nearer the normal period, it is likely that this impression is correct.

With regard to the time of emergence, the first two insects emerged between 11 and 12 a.m., and the third emerged some time before 10 a.m.

NOTES ON THE VARIATION OF *PERONEA CRISTANA*,
FAB., WITH DESCRIPTIONS OF SIX NEW FORMS,
AND THE REASONS FOR SINKING THE NAMES
AT PRESENT IN USE OF SIX OTHERS.

By W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 39.)

There is one feature that strikes one forcibly in looking through this collection—that the size of the button is rapidly increasing. This is not my own view only : amongst others Mr. South, whose knowledge of the species far antedates mine, has pointed it out, and there does not seem to be any doubt about it. With the exception of the *ruficostana* group one rarely nowadays sees a specimen without a button. On the other hand, all the forms without buttons, or with only small buttons, were either named in the first half of the last century, or they were named from old specimens (of course excluding some of the *ruficostana* group), as the following list of names will show : *Alboflammana*, Curt., *xanthorittana*, Dsvgs., *unicolorana*, Dsvgs., *prochantana*, Clark (from old specimens), *vaughaniana*, Webb (old specimens), *prostriana*, Clark (old specimens) *fulvana*, Sheldon (old specimens). Of these forms the only modern examples I have seen alive are one each of *prostriana* and *xanthorittana*.

The Webb series contains so many rare forms it will perhaps be interesting to enumerate the most important of them, including—

Ab. *alboflammana*, Curtis. A fine series of 24 examples, all old and on white pins, including 5 Bond, 1 Clark, 2 Harper, the rest unlabelled.

Ab. *subalboflammana*, Clark, the type, and 4 others, one of which is labelled "Clark Colln.," the others are unlabelled, but presumably they are from the same source.

Ab. *unicolorana*, Dsvgs. Thirty-three examples, all on white pins, 9 of them on the old round-headed pins, 10 labelled "Bond," 1 "Burney," 1 "Clark," the remainder unlabelled.

Ab. *xanthorittana*, Dsvgs. A fine series of 17 examples, including Clark's type of *proxanthorittana*, which is without data. All are old specimens on white pins, 7 labelled "Mason," 1 "Clark," and 1 "Bond," the remainder are without data.

Ab. *nigropunctana*, Clark. The type (without data, a somewhat old specimen mounted on a gilt pin), and 7 others, of which 1 is labelled "New Forest, 1891, S.W.," 2 "Bond," 1 (on black pin) "New Forest," probably from Clark Collection, 1 on black pin, unlabelled, but probably from Clark, and 2 old specimens on gilt pins, unlabelled.

Ab. *prochantana*, Clark. The type (without data) and 12 others all on white pins, one of which dates *ante* 1850. All are without data except one, which has been labelled by Webb, "Clark."

Ab. postchantana. This is of course one of Webb's creations, which he describes as having a dark button; he writes of his series (*loc. cit.*, vol. xliv, p. 290) as consisting of "4 specimens purchased at Clark's sale." There are 4 examples labelled this form in his series, but one has a white button, and is therefore *ab. chantana*, Curt. He writes (*loc. cit.*) that he has long had this form in his cabinet. What has become of the specimens does not appear. Mr. South has two examples of this form from the New Forest.

Ab. vaughaniana, Webb. The series under this label consisted of 8 specimens, and there was another amongst the *unicolorana*. They are all old examples mounted on white pins, and are without data.

Ab. lichenana. Two unlabelled specimens on white pins.

Ab. ruficostana, Curtis. Seven good examples, all without data, except one labelled "Burney." Probably most of these came from Clark, especially 3 on black pins; the remainder are old and on white or gilt pins.

Ab. attaliana, Clark. The type-specimen, without data, but set on a black pin, and presumably coming from the New Forest. This specimen is, so far as I know, unique, for though there is a second specimen put with it, this is, as Webb says (*loc. cit.*), only an example of *alboruficostana*, Clark.

Ab. nigrocostana, Clark. The type and 6 others. This form seems to be getting a little more frequent; I have 4 from the New Forest and 1 from Epping Forest, all taken by myself. Mr. South has 9 examples, all from the New Forest.

Ab. transversana, Clark. The type and 3 others, all without data, but old examples, set on white pins, and presumably from the Clark Collection.

Ab. prostriana, Clark. The type (without data) and 19 other fine examples, all on white pins, 2 *ante* 1850, 9 labelled "F. Bond," the remainder unlabelled.

Ab. insulana, Curt. Twenty examples, the majority on white pins; 6 labelled "Bond," the remainder are without data.

Ab. profanana, Fab. There are 31 specimens under this name, 4 of which are *substriana*, 9 *subunicolorana*, and the remainder accord with Stephens' idea of *profanana*. These are all old specimens, on white pins, 12 labelled "Bond," 1 "Epping Forest," the remainder are without data.

Ab. provittana, Dsvgs. The only specimens in the series of *cristana* that fit in with Desvignes' description are, as before stated, 10, most of which Webb had included in his series of *nigropunctana*; 7 of these are on gilt pins, 2 of which are labelled "Bond Colln.," the others are without data. The remaining 3 are more modern; they are mounted on black pins; 1 of them is labelled "Clark," the other 2 have no label. I regard this form as a very rare one nowadays. Most of Desvigne's *Peroneas* came

from Whittlebury Forest in Northants, which now, I believe, owing to enclosure and consequent changes, no longer produces this genus—at any rate in the old profusion.

Semistriana, Dsvgs. Webb speaks of this (*loc. cit.*) as very rare, and his series consists of 4 examples—2 on gilt pins labelled "Bond," 2 on black pins, probably from Clark; I do not find *semistriana* very rare in the New Forest nowadays; I have 12 examples from there.

Jansoniana, Webb. Eight specimens, all from Clark, without data, but from Webb's note (*loc. cit.*) one would infer they came from Epping Forest. I question this, for I have never taken one there; nor have I heard of anyone who has. In the New Forest nowadays it is not uncommon; I have 8 taken by myself there, and Mr. South also has some from the same source.

Procrystalana, Webb. There are 5 examples, all modern specimens, mounted on black pins, probably from Clark, but they are without data. I regard this as a very rare form; I have only two examples, which were obtained in the New Forest.

The cream of the Webb series consists of the rare and beautiful white forms, of which there are no less than 117 examples. These consist of—

Ab. *capucina*, Johnson. Of this rare form there are 16 examples, all old specimens, set on white pins; 2 are labelled "Burney Collection," the others are without data, but I gather that the bulk of them came from the Mason Collection.

Ab. *subcapucina*, Dsvgs. A magnificent series of 67 specimens, very variable, and including one with a black button, and several with pure white basal areas to the superiors. There are 26 beautiful examples from Folkestone, taken by Mr. Purdey; most of the others are older specimens, mounted on white pins, half a dozen of which would date *ante* 1850; 7 of these are labelled "Mason," 2 "Bond," 2 "Edwin Sheppard," 1 "Sorell (Deal)," and 1 "Standish"; the others are without data.

Ab. *purdeyana*, Webb. There are, of course, the two specimens Webb got from Clark, one of which is the type, and also two others which were included with the *subcapucina*, one of these is labelled, in Webb's writing, "from Dr. Mason lot 22. Folkestone W. Purdey 1884": the other is without data. These specimens are very interesting, because Mr. Purdey does not remember taking any previous to 1892, but there is no doubt but that they were pinned and set by him. There was a fifth specimen of *purdeyana* amongst the *subcapucina*. This is old, and set on a white pin. Mr. Purdey informs me that in addition to the 4 in the Webb Collection, which are set in his style, he has taken in all 7 specimens, 6 of which he possesses and the other is in the collection of the Hon. N. C. Rothschild.

Ab. *gumpinana*, Johnson. There are 6 fine examples of this rare form, all old and mounted on white pins, with the following

data : Two from Dr. Harper, 2 from Mason, and 2 from Standish. Commander Walker has kindly examined the series of *cristana* in the Dale Collection at Oxford, and he informs me there is included in it a specimen of ab. *gumpinana*, labelled "New Forest, Johnson." This is probably the type-specimen. Nearly allied to this form is an example which is probably unique ; it resembles in all respects *gumpinana*, with the exception that it is without the white vitta ; it came from Dr. Mason.

Ab. *masoniana*, Clark. There is the type-specimen, which is without data, but respecting which Webb says that he gathers it came from Dr. Mason. There are also 4 other specimens identical with it in that they have its most characteristic feature, the ochreous vitta, but they have white buttons in place of the ochreous one which obtains in the type-specimen. One of these is labelled "New Forest. Clark. 1893" ; 1 "Burney's Duplicates" (what a delightful duplicate!) ; 1 "Stevens & Mason Collns." The fourth example came from Dr. Harper's Collection. All these, with the exception of Clark's specimens, are old, and set on white pins. This is one of the rarest forms of *cristana* ; the only other examples I know of are two in Mr. South's Collection, which—and I fancy most, if not all of the others—came from the New Forest, and one in the Dale Collection at Oxford.

Ab. *tolana*, Dsvgs. Of this rare and beautiful form there are 6 fine examples, 3 of which were taken at Folkestone by Mr. Purdey ; 1 is labelled "Burney Collection," 1 "Vaughan, Stevens & Mason Collns." ; the other specimen is without data. Mr. Purdey informs me *in litt.* that he has at various times taken five of this form, all at Folkestone.

Ab. *curtisana*, Dsvgs. = *charlottana*, Clark. Of this, which Webb truly says is the most beautiful of all the *cristana* forms, there are, as previously stated, 3 examples, 1 from Clark, 1 Mason, and 1 without data.

Ab. *ochreana*, Sheldon. There are 5 examples of this form, all old, set on white pins, 2 from Harper, 2 from Burney (one dating *ante* 1850), and the fifth without data.

Ab. *flavana*, Sheldon. Two examples from the Clark Collection, one labelled "New Forest."

Webb's series contains the type-specimens of all the forms named by Clark in addition to those enumerated above.

Youlgreave,
South Croydon ;
September, 1920.

THE HETEROPTERA OF INDO-CHINA.

BY W. L. DISTANT.

(Continued from p. 44.)

Menida salvazana, sp. n.

Body above dull ochraceous; head centrally and laterally (sometimes almost wholly) two anterior spots, the basal area and sometimes a central transverse undulating line to pronotum, a large sub-basal spot and two smaller marginal spots before apex of scutellum, and a central and a larger apical spot to corium dark metallic green, sometimes almost black; membrane hyaline or subhyaline; body beneath and legs (imperfectly seen in carded specimens) more or less brownish ochraceous; above somewhat thickly and coarsely punctate; antennæ with the second and third joints shorter than the fourth and fifth joints.

Long, 6½-7 mm.

Tonkin; Luang Prabang; Haut Mékong.

NEOJURTINA, gen. nov.

Allied to *Jurtina*, Stål, but with the basal joint of antennæ reaching and slightly passing the apex of head; rostrum not or scarcely passing the base of the abdomen. Other characters as in *Jurtina*.

Neojurtina typica, sp. n.

Head ochraceous, the lateral marginal areas finely darkly punctate; antennæ pale castaneous, third and fourth joints longest; eyes black; pronotum with the anterior half ochraceous, with its margins distinctly paler, posterior half and the scutellum and corium darker castaneous, lateral marginal areas of the corium stramineous, the whole upper area thickly and somewhat coarsely punctate; body beneath, legs and rostrum stramineous; abdomen with a deep broad central longitudinal furrow.

Long, 16 mm.

Tonkin

EPAGATHUS, gen. nov.

Body obovate, head a little longer than broad, moderately narrowing to apex, which is slightly cleft; the lateral lobes being slightly longer than the central lobe, lateral margins moderately convex; antennæ five-jointed, basal joint not reaching apex of head; rostrum reaching the posterior coxae, first joint about reaching base of head; pronotum twice as broad as long, the lateral angles broadly extended a little forwardly and upwardly; scutellum about as broad at base as long; membrane slightly passing the abdominal apex; base of abdomen with a short obtuse tuberculous spine arising from the second segment; basal margin of pronotum straight.

Allied to *Sabaeus*, Stål.

Epagathus chapana, sp. n.

Pale olivaceous green, thickly and somewhat coarsely punctate, membrane shining bronzy brown; antennae pale greenish, apical area of the fourth and the whole of the fifth joint reddish ochraceous; basal joint not reaching apex of head, third joint shorter than second, fourth or fifth joints; body beneath paler than above, rostrum, disc of sternum, bases of femora and the tarsi more or less ochraceous; rostrum more or less ochraceous and reaching the posterior coxae; body above thickly and rather coarsely punctate.

Long, 10 $\frac{1}{2}$ to 13 mm.

Chapa.

UDONGA, gen. nov.

Body elongate; head a little longer than broad, lobes of almost equal length, lateral lobes strongly oblique near apex; antennae with five joints, basal joint stoutest, not reaching apex of head; rostrum moderately stout, about reaching posterior coxae; pronotum broader than long, the anterior lateral angles shortly toothed, the posterior lateral angles almost perpendicularly spinous; scutellum elongate, about apical fourth narrowed and extending beyond the middle of abdomen, which is only moderately posteriorly narrowed and has the apical angles of the sixth segment shortly but prominently toothed.

I have placed this genus near *Dabessus*, Dist.

Udonga spinidens, sp. n.

Body above brownish ochraceous, thickly and somewhat coarsely punctate; head more darkly punctate, eyes blackish; antennae dark ochraceous, basal joint, and fourth joint excluding base and apex, blackish; rostrum moderately stout and reaching posterior coxae, pale castaneous in hue; body beneath stramineous, somewhat sparingly and coarsely punctate, abdomen with three more or less broken longitudinal dark fasciae; antennae with the first and second joints shortest, the first robust; the abdomen with the area of the spiracles distinctly darker and more blackish in hue.

Long, 12 mm.

Haut Mékong; Pang Tiac.

Paterculus aberrans, sp. n.

Brownish ochraceous with small pale ochraceous mottlings; narrow lateral margins of the pronotum and narrow basal lateral margins of the corium pale sanguineous; head beneath, sternum and legs pale ochraceous, the sternum darkly punctate; abdomen beneath darker ochraceous, the segmental incisures, stigmata and a double sublateral series of spots, black; antennae pale ochraceous, third and fourth joints longest; rostrum reaching the intermediate coxae.

Long, 12 mm.

Luang Prabang; Muong You.

Allied to *P. affinis*, Dist., but with the apex of the rostrum only reaching the intermediate coxae.

NEW FOREST NOTES AND CAPTURES, 1920.

BY HUGH P. JONES.

(Continued from p. 48.)

Osmia: This family is apparently very scarce here. None seen, although I made no special hunt for them. With the exception of *parietina* and *leucomelana* I have taken all the species in Cambis.

Authidium manicatum occurred in Lymington gardens.

Melecta: Only *M. armata*; found in the greatest abundance at "Perry Wood" (Brockenhurst), in May and June. *Anthophora retusa* and *A. pilipes* from same locality, the former much the commonest, reversing the usual order, whilst *A. quadrimaculata* was quite plentiful on banks at Norley Wood and other places, but always apart from *Sarapoda bimaculata*, even when the latter is found in the same gravel-pit as at Setley, each species keeping to its own corner. The plaintive high-pitched hum of these two chubby little bees is quite a characteristic of the heaths in August. It may be my fancy, but *bimaculata* seems to possess a shriller note than its ally.

Psithyrus: *Ps. rupestris* (males only taken), *Ps. barbutellus*, *Ps. vestalis* (the latter very commonly).

Bombus: *B. renustus*, *agrorum*, *hortorum*, *lapidarius* and *terrestris* were all fairly common, but such species as *sylvarum*, *pratorum* and *derhamellus* were rather unaccountably absent. I used to take *pratorum* in great abundance at raspberry flowers in a Cambridge garden.

A few males of *B. jonellus* from heaths complete my list of Aculeates.

DIPTERA.—Even the "forest fly" was scarce this summer, and I have few species to record. Typical forest things such as *Tabanus bovinus*, and *Echinomyia grossa* were totally absent in places where they were abundant in 1919. *T. bovinus* I only found at Lyndhurst in July, but a solitary ♀ (?) was heard at Park Hill in August. What a difference compared with last year when collectors were almost driven out of some enclosures by the bites of *Chrysops*, *Tabanus*, etc. *Therioplectes tropicus* and *Tabanus maculicornis*, however, were exceptions to the general rule, both being unusually abundant in the spring; the former being especially so at Rhinefield, completely routing my sister, who was there with me at the time.

After June, however, it was a rare thing to see a *Tabanid* of any description, everyone commenting on the fact that there were so few flies. Unfortunately, one could not enjoy the absence as everything else seemed to have disappeared also, notably those fine aberrations of *D. paphia* and *L. sibylla*, the presence of which one had come to look upon as an annual event of increasing

popularity and importance. The following is a short list of my most interesting captures in Diptera. Some of the dates given are remarkably late: *Pedicia rivosa* and *Tipula gigantea*; *Stratiomys potamida* (Royden on *Umbelliferæ* in July); *Hæmatopota pluvialis* and *H. crassicornis* (the latter at Wood Fidley); *Therioplectes solstitialis* and *distinguendo*, Verr.; *Th. tropicus* (latest date of the former—a perfectly fresh ♀—September 10th!).

Atylotus fulvus was very scarce and erratic in appearance in June, and then again in August, when I took a fine ♂ on Setley Plain. *Tabanus bovinus*, *T. bromius* and *T. maculicornis*, all found (the latter very abundantly), but *T. autumnalis* not seen this year.

Chrysops cæcutiens and *C. quadrata*. These very handsome "blood-suckers" were both unusually scarce, and a female of the former was taken as late as September 20th at Royden. *Dioclea atricapillus*, *Laphria marginata*, *Asilus crabroniformis* (scarce in August at Norley Wood and Setthorns); *Neoitamus cyanurus* and *Machimus atricapillus*. *Anthrax circumdatus* was found at Setley amongst the bee *A. quadrimaculata*, and the only *Bombylius* seen was *B. major*. *Empis tesellata*; *Chilosia sparsa*; fine forms of *Syrphus*; *Rhingia campestris*; *Chrysochlamys cuprea*; *Sericomyia borealis* (always very common); *Chrysotoxum festivum* and *C. bicinctum*. The family *Xylota* was, as usual, much in evidence, *X. sylvarum* being first in point of numbers, but *X. florea*, *lenta*, etc., followed fast. *Conops ceriiformis* (two forms), *C. quadrifasciata* and *Physocephala rufipes* amongst the *Conopidae* were all taken; also *Sicus ferrugineus* (scarce), and *Myopa buccata*. *Alophora hemiptera* was common on flowers of privet in June at Park Hill, where *Acrocephalus globulus* was "beaten" later.

Echinomyia ferox and *E. grossa* were not seen this year south of Brockenhurst, whilst *Miltogramma punctatum* was common at the burrows of *Colletes*, etc., during August and September.

As previously stated, *Hippobosca equina* was unusually scarce, although a smashed caravan on one side of the road at Stockley enclosure, and a plunging horse tied to a tree at the other, suggested this wretched parasite, but might only have been due to a motorist.

COLEOPTERA.—All remarkably scarce. I merely mention the following as they are typical forest beetles, and more or less local.

I have to thank Mr. G. Gulliver for obtaining several fine *Longicornia* for me, notably the imposing *Prionus*.

Calasoma inquisitor (this year hardly obtainable); *Necrophorus vespillo*; *Silpha thoracica* and *S. quadripunctata*.

Lucanus cervus (the "stag-beetle") is very abundant in Lymington gardens, and wood yards, and flies commonly in the streets at dusk).

(To be continued.)

SOUTH AMERICAN EUMOLPIDÆ, MOSTLY OF THE
GROUP COLASPINI.

BY FRED. C. BOWDITCH.

(Continued from p. 30.)

Colaspis klagii, sp. nov.

Like a small *trivialis*, Boh. Above, shining bronze, below, brown; legs rufous with knees and tarsi more or less darkened; antennæ rufous, darker at last two or three joints; thorax punctured, smooth and convex, strongly obtusely angled at the middle; elytra regularly geminate punctate, striate, with raised, smooth longitudinal intervals, costate at the apical end, the extreme reflexed edge of the thorax and elytra and all the punctures cyaneous; hind ♂ tibia abruptly angulate within at the middle.

Type, ♂ and ♀, Amazon Valley, near Santarem (Klages).

Length, 4·5–5 mm.

Resembles a small *interstitialis*, Lef., and probably mixed with it in collections, but separable by the ♂ tibia. Head closely punctate with a flattened depression on the front and the usual smooth calli; thorax evenly convex and the punctures only slightly more crowded at the sides, elytral punctuation very regular, hardly disturbed at the scutell or sides. *Klagii* and *dilatipes* belong to the *interstitialis* group; from analogy I infer that probably *subaequa*, Jac., and *leferrei*, Bow. (*geminata*, Lef.), have dilated ♂ tibia.

Colaspis punctipennis, sp. nov.

Size of a small *trivialis*, Boh.; elongate. Brassy æneous, shining; legs, palpi, labrum and antennæ rufous, the latter fuscous at the end; head densely punctate except the extreme vertex; thorax coarsely punctate and sinuate, bidentate at the sides; elytra everywhere grossly, almost foveate, punctate, transversely confluent, forming rugæ everywhere, except the sides and apex, where there are the usual costæ; inner edge of hind tibiae sharply, angularly dilated below the middle.

Type, ♂, Teresopolis (first Jac. Coll.).

Length, 6 mm.

Head with broad triangular depression in front, the usual smooth calli obsolete; the elytral punctuation is very coarse, noticeably so in the very obsolete transverse depression. The form of the tibia seems different from any of the allied species—the ♀ probably has more costate elytra. It is probably mixed in collections with *pruinosa*, Lef., which occurs from the same locality and is often the same size.

Colaspis basipenne, sp. nov.

Medium sized; elongate. Chestnut brown, with a metallic green, humeral lateral spot, continuing narrowly around the base and then running down the suture vanishing at the posterior third; joints 6 and 7 of the antennæ dark (10 and 11 missing).

Type, ♂, Cochabamba, Bol. (Germ.).

Length, 7.5 mm.

Head finely punctured with deep transverse and longitudinal grooves; thorax grossly and unevenly punctured with scattered smooth areas and confluent spaces, sides strongly angulate at the middle; scutellum smooth, brown; elytra finely, closely punctured, near the suture in rows or semigeminate series, the interspaces more or less raised and smooth, becoming well developed and regular at the apex; somewhat similar in marking to *cinctella*, Lef., but much larger.

Colaspis dispar, sp. nov.

Medium sized. Below æneous fulvous, shining, tinged with metallic green; above æneous bronzy, shining, with all the edges and punctures coloured with metallic green; antennæ and legs flavous, the former darkened at the tip; the hind tibia of the ♂ slightly curved at the apex.

Types, two ♂, two ♀, Tanampayo, Boliv.

Length, 5-7 mm.

Head rather thickly and coarsely punctured with deep transverse and foveate longitudinal depressions; epistome finely punctured; thorax grossly and unevenly punctate, with scattered smooth areas and confluent punctures, sharply angulate each side at the middle, with sinuate edges before and behind the angle; scutellum smooth; elytral punctuation strong, semi-geminate; intervals pretty well defined as smooth areas, becoming strongly costate at rear, where the punctures become simple as usual. I place the species near *tarsata*, Lef., and *amazona*, Jac.

Colaspis otileensis, sp. nov.

Medium sized. Stout below, with the head and thorax greenish æneous, the latter shining, sparsely punctate, sides triangulate; elytra cyaneous blue, tinged with green near the thorax; legs black, except thighs, which are coloured like the underside, and rufous at the base; antennæ very dark fuscous; elytra square at the base with prominent shoulders, each side with eight or nine costæ which become obsolete in the rear; surface finely punctate.

Type, ♀, Chaco, Bolivia.

Length, 7 mm.

Head rather coarsely punctured, front continuous, with a well-marked fovea on the vertex; antennæ more than half the

length of the body, slightly incrassate at tip; thorax broader than long, a well-marked fovea on each side, next the margin, the punctuation sparse and fine except around the fovea; elytra with well-marked shoulder knobs and transverse and post-scutellar depressions, somewhat interrupting the costæ, which, beginning with those next the suture, gradually tone down into smooth interspaces, having the punctures arranged in more or less genimate rows, especially on the rear disc.

The square prominent elytral base and shoulders give this form the appearance of a species of *Otilea* like *fulva*, Jac.

Colaspis brunneipennis, sp. nov.

Rather large and stout. Body below bluish black, above with head, thorax and scutellum æneous black; elytra chocolate brown, both thorax and elytra very narrowly margined with metallic cyaneus; feet, antennæ, labrum and palpi testaceous.

Types, three ♀, Balzabampa, Ecuad, (Haenseh).

Length, 6-8 mm.

Head thickly punctate with both transverse and longitudinal grooves and smooth antennal calli; antennæ about half the length of the body, partly fuscos in some examples; thorax strongly transverse, subbidentate on the sides, or unindentate with a sinuation in front; surface grossly and confluent punctate and deeply foveate on each side, just back of the middle; elytra with a very obsolete basal depression, grossly confluent and sub-geminately punctate, with the intervals semicostate or costate at the sides and apex, easily recognised by its colour; ♂ is unknown.

Colaspis peruviana, sp. nov.

Short, stout, ovate, shining. Above purplish æneous, below with legs cyaneous green or blue; head thickly punctate, faintly impressed; thorax coarsely punctate, sparsely so on the disc, sides strongly angulate at the middle; elytra grossly foveate punctate, semi-seriatel arranged, and transversely confluent in places; the longitudinal intervals costulate near the apex and sides; inside of hind tibia of ♂ with a minute spine at apical third.

Type ♂ and ♀, Peru (Callanga?) (second Jac. Coll.).

Length, 4 mm.

The punctuation of the thorax is much coarser than in *chaleites*, the elytra more convex and the punctures much more foveate. It is nearly related to *melancholica*, Jac., from Mexico. This latter, as well as *nigrocyanea*, Cr., both have notched or spined ♂ tibia.

Colaspis 4-foreata, sp. nov.

Size of *subænea*, Jac. Body below cyaneous black, above æneous bronze with a faint greenish tint; thorax wide, strongly

angulate at the middle, thickly and rather heavily punctate, with a few irregular smooth places on the disc, and with four well-marked foveæ placed transversely behind the middle (they show best looking from the front); elytra closely geminate punctate (except next the suture); intervals costate, the alternate ones wider and stronger.

Type, ♀, St. Catharina, Brazil.

Length, 4·5 mm.

Head everywhere thickly punctate; antennæ short, dark, rufous towards the base, the first six joints shining, the rest and the base of the femora more or less rufous. Until the ♂ is seen it is difficult to assign its nearest relative.

Colaspis 12-notata, sp. nov.

Small, spotted, slender, elongate. Body beneath very dark brown, with sides of prothorax red; above, head, thorax and scutellum red with black eyes and jaws; elytra dark, dull, bluish black, each side with six yellowish spots placed 2-2-1-1; legs flavous; upper sides tinged with black.

Type, one ♂, Cochabamba, Boliv. (Germ.), one ♀, Beni R., Boliv. Length 4·5 mm.

Nearly related to *ornatipennis*, Jac., and possibly a variety of it; antennæ dark brown, base rufous; head very finely punctate, strongly transversely depressed between the eyes, vertex foveate; thorax slightly collared in front, sparsely and finely punctate, sides moderately angulate, sinuate just behind the middle; elytral depression barely showing just below the shoulder, surface punctate striate with smooth intervals at apex; the light spots are arranged two on the disc before and two behind the middle, small and round, not marginal; a larger transverse one near the tip, and the last small, at the extreme apex; easily recognised by the twelve spots.

Colaspis cinctipennis, sp. nov.

Small; spotted, slender, elongate. Body beneath yellow, with abdomen dark brown; head and thorax shining flavous, eyes black; elytra dark, violet plum colour, with a wide sublateral flavous band running from shoulder to shoulder, also on each elytron three spots—a small basal next the shoulder, a larger triangular, a little before the middle, placed so that the base is towards the suture and with the apex joined to the lateral band, and a submedian elongate spot next the suture.

Type, one ♂, Dr. Hahnel, Amazon (Staudinger).

Length, 3 mm.

Nearly allied to my 12-notata; antennæ relatively long, light brown, rufous at the base; head finely punctate with the usual cross depression; thorax slightly collared, lightly punctate, especially on the disc, sides strongly angulate at the middle; scutellum

dark rufous; elytra semi-regularly punctate striate on the disc, becoming regular at the apex, the punctures stronger on the lateral flavous band; legs pale flavous, with rufescent or darker tarsi. The markings make this form easily known; looked at from above the spots are more noticeable than the band, and all the markings, especially the lateral band, appear smaller.

(To be continued.)

NOTES AND OBSERVATIONS.

DEPRESSARIA AUTOCNISTA, N. SP.—I propose this name for the insect hitherto known as *aspersella*, Const., from South of France. It seems to have been overlooked that Constant's specific name (published in 1888) is preoccupied by *adspersella*, Koll. (1832), in the same genus; the two names are simply variant spellings (both admissible) of the same word, and cannot be treated as distinct names without probability of confusion.—E. MEYRICK; Thornhanger, Marlborough, January 15th, 1921.

MARGAPODES UNIONALIS IN SUSSEX.—Early in October last a specimen of *Margarodes unionalis* was taken at "sugar" by Mr. Thomas Salvage in his garden at Arlington, a village some seven miles inland from this part of the coast, and sent to me for identification. This capture appears to be of some interest when taken in conjunction with those on the Devon Coast reported at p. 20 of this Journal, as showing that the immigration to which they are undoubtedly due must have been of wide range although possibly not large in numbers.—ROBERT ADKIN; Eastbourne.

[This species was first noted as occurring in Britain in 1859. Subsequently odd specimens were recorded from Brighton, Deal, Forest Hill, Gosport, Gravesend, Isle of Wight, Torquay and Tresco. In 1881 a specimen was secured at Gosport on October 23rd. The only records we have any note of between 1881 and 1920 are the following: A specimen taken at a lamp at Boscombe, September 21st, 1900 ('Entom.', vol. xxxiv, p. 182); one at Hythe, October 27th, 1913 ('Entom.', vol. xlvi, p. 314); two in South Devon, October 12th and 13th, 1920 (*antea*, p. 20).—ED.]

LIMENITIS SIBYLLA IN WARWICKSHIRE.—On a Saturday evening at the end of the first week in August, 1918, in company with my respected entomological friend, Mr. J. W. Saunt, we were proceeding at precisely 7 p.m. to meet other entomologists to spend a night sugaring, etc., for moths. On approaching our destination, in a narrow defile, Mr. Saunt suddenly made an overhead and backhanded stroke with the net and captured a fly which weakly flew across the path, exclaiming at the same time—"Sibylla." That night, seated round the camp fire, after arousing the curiosity of our assembled friends, I had the pleasure of announcing this important capture. Mr. Saunt proclaimed his intention of liberating the insect at sunrise in the woods, to give it a chance of reproducing its race, for it appeared to be a female insect. Sad to relate this little faded flower

of the air died that night in the box, before it had time to regain its promised liberty. On Sunday, June 29th, 1919, a dull and cloudy morning, not far from the spot above referred to, in the glade of a wood, overgrown with honeysuckle, I was startled by the weak flight of a butterfly overhead. I saw the underside against the light and recognised *Sibylla*. I struck at it and the insect appeared to fall to the ground, I groped about for it amongst the leaves and foliage upon the ground, and just as I was giving up the search I saw something flutter a little, popped a glass-bottomed box over it and secured the prize. It was the first specimen I had caught, or in fact possessed, and only the second I had seen on the wing. It proved to be a male, perfect to a scale. The fortnight following was wet and dull, but on Sunday, July 13th, a warm and sunny morning, when visiting the same spot in company with my brother, we had the good fortune to meet with several more of these butterflies which were flying up and down the glade. I was privileged to secure another specimen, a female this time, in perfect condition, and my brother also obtained one. As a matter of fact, although we possessed only the specimens referred to we had no desire to exterminate it. There were certainly several more flying about when we left, and subsequently Mr. H. Wagstaff, the Secretary of the Coventry Natural History Society, also observed its evolutions on the same spot or near it without attempting its capture. Last year, 1920, I had not the opportunity of visiting the spot owing, firstly, to absence on holiday from July 2nd to 19th, and this, with subsequent bad weather, kept me away till the beginning of August. I did not at that time see it, but I do not despair of seeing it during the coming season, and, I hope, in increased numbers.—E. H. SILLS; "Sibylla," Bray's Lane, Coventry, January 14th, 1921.

REARING OF HYLOICUS PINASTRI LARVÆ.—In my article on *H. pinastri* in the 'Entomologist,' November, 1919, I stated that all my captures with the exception of two were made on the sunny side of the pine trunks. I made a further effort for this insect last year, working the pine woods at Aldringham and Woodbridge. My captures, sixteen in all, were with one exception on the opposite side of the trunks, plainly showing, owing to the wind blowing on each occasion, that the sheltered side was the favoured one. In 'Practical Hints' I notice it is stated that the larvæ appear easy to rear; my experience has been very much to the opposite. From about 170 ova or more in 1919 I fed up nearly to full size about 150 larvæ: eventually two pupated but no moths emerged. In 1920 I sent living females to several friends. Newman, of Bexley, and myself appear to have been the most successful. I obtained 140 ova, and of these only 23 hatched. When full-fed two larvæ died. Out of the remaining 21 only 8 formed perfect pupæ, and a centipede finished two out of the eight. The remainder mostly attempted the change but formed misshapen pupæ.—E. CRISP; "Heathcote," Heathfield, Sussex.

NEW FOREST HYMENOPTERA ACULEATA (1920).—The following species have been accidentally omitted from my list of above: *Ompilus bicolor*, *P. minutulus*, *P. spissus* (all scarce), *Nomada*

succincta (common), and *Stellis aterrima*. The last insect is represented by a solitary ♀ from a Lymington garden, and is a rather surprising capture, inasmuch that *Osmia*, on which *Stellis* is parasitic, was not once seen here throughout the summer. *Anthidium manicatum*, however, is common locally and a likely host—possibly merely the *locum tenens*!—HUGH P. JONES; Eastlands, Lymington, Hants.

SCARCITY OF BUTTERFLIES IN GLOUCESTERSHIRE IN 1920.—*Polygona c-album* did not appear here at all last autumn and I saw but one *Celastrina argiolus* throughout the season, though the latter has previously been abundant here for some years. The only butterfly seen in any numbers during the autumn of 1920 was *Pyrameis atlanta*.—B. A. CONEY; Pucklechurch, Gloucestershire.

EARLY EMERGENCE OF *TEPHROSIA CREPUSCULARIA*.—On January 23rd I noticed a fine, newly emerged and perfectly developed ♀ of this species in one of my cages, which are kept outdoors throughout the winter. The batch of pupae from among which this individual emerged were reared from ova laid by a wild ♀ taken from a tree-trunk on July 4th, 1920.—A. T. POSTANS; 148, Fawcett Road, Portsmouth.

PANORPA COMMUNIS, L. (VARIETY).—In connection with examples which ('Entomologist,' liii, p. 255) I referred to an extreme form of var. *aperta*, Laeroix, the author of that name writes saying that he thinks a name is required for the extreme form as well. I therefore name it var. *erstincta*.—W. J. LUCAS; 28, Knight's Park, Kingston-on-Thames, November 19th, 1920.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—November 11th, 1920.—The President in the Chair.—Mr. A. F. Hemming, F.Z.S., F.E.S., Treasury Chambers, S.W. 1, was elected a member.—Mr. Grosvenor exhibited numerous species of *Limenitis*, *Athyyna* and *Neptis* from Thibet and the Hindo-Malay region.—Mr. Newman, gradations from the dark Rannoch form to the very light southern form of *Polyptychus flavicornis*.—Mr. Bennett, a *Mimas tiliæ*, with the usual transverse bar reduced to a small triangular discal spot.—Mr. B. S. Williams, a *subradiata* form and a *cæruleopunctata* form of *Rumicis phleas* from Finchley.—Mr. A. A. W. Buckstone, several series of *Hygrochroa syringaria*, bred and inbred from larvae taken at Wimbledon in 1913, 1915 and 1919 with captured specimens, and read notes on the pairings and broods obtained; he also showed living pupæ and imagines of *Pyrameis atlanta* and full-fed larvae of *Abraxas grossularia*.—Dr. Dixey, F.R.S., read a paper on "Sexual Dimorphism," illustrating his remarks with a large number of coloured diagrams and a series of lantern-slides.

Annual Exhibition.—November 25th.—Mr. K. G. Blair, B.A., President, in the Chair.—Mr. G. D. Morison, 100, Fielding Road,

W. 4; Mr. D. Watson, 12, Park Place, Gravesend; Mr. G. W. Young, F.G.S., 20, Grange Road, Barnes; Mr. W. West, 29, Cranfield Road, Brockley; Mr. F. H. and Mr. H. M. Simms, The Farlands, Stourbridge, were elected members.—A short series of *Leptomeris (Acidalia) immorata* and of *Ino (Rhagades) globulariae* from Sussex were presented to the Society's collection by Mr. F. G. S. Bramwell, of Brighton, and were exhibited.—Lord Rothschild exhibited the series of 1277 specimens of *Abraxas grossulariata*, L., from the British Collection of the Tring Museum. They consisted of the series from the Bright and Gibbs Collections and those collected by himself. The larger number of the more extreme varieties have been bred by the Rev. Gilbert Raynor.—Mr. C. H. Williams exhibited a drawer of varieties of the same species.—Mr. Hy. J. Turner, a large number of extra-European forms of well-known species and species closely allied to those in the European area.—Mr. W. G. Sheldon, his series of about 1400 specimens of *Peronea cristana*, including examples of all the 72 named forms and the type-specimens of 39 of them. He also showed about 250 examples of *Leptogramma literana* and its numerous forms.—Mr. Percy M. Bright, a long series of *Epinephele tithonus* aberrations, including a white suffused form and a gynandromorph, and *Argynnис aglaia* forms, including several magnificent melanic aberrations, and a scaleless specimen with perfect fringes.—Mr. B. W. Adkin, a series of aberrations of *Satyrus semele*, including a male from Kent with four eye-spots on the fore wing.—Mr. T. H. Grosvenor, series of British species which occur in India, including *Papilio machaon*, *Pieris brassicæ*, *P. rapæ*, *Gonepteryx rhamni*, *Colias hyale*, *Apatura iris*, *Pyrameis cardui*, *Polyommatus icarus*, *Aricia medon*, *Rumicia phœas*, etc.—Mr. Pickett, series of aberrations of *Agriades coridon* taken in 1918, 1919 and 1920.—Mr. L. W. Newman, aberrations shown in the different British races of *Melitaea aurinia*; a hybrid of *Selenia bilunaria* and *S. tetralunaria*; *Colias edusa* with one wing bleached; a yellow Cheltenham form of *Gonodontis bidentata*; melanic examples of *Zygæna trifolii*; extreme forms of ab. *varleyata* of *Abraxas grossulariata*, etc.—Mr. Riches, *Cossus ligniperda*, including a specimen with almost black hind wings.—On behalf of Mr. L. A. E. Sabine, Mr. Newman, a long series of the beautiful race of *Polyommatus icarus*, series of the Irish forms of *Epinephele jurtina*, *Rumicia phœas*, including ab. *alba*, *E. tithonus*, *L. sinapis*, etc.—Mr. A. A. W. Buckstone, aberrations of *Hipparchia semele*, of many local races.—Rev. Geo. Wheeler, a series of *Melitaea phœbe* from Central Europe, showing a wide range of variation over a limited area.—Mr. C. W. Sperring, aberrations of British Lepidoptera, including *Colias edusa* var. *helice*, minus blotches in border on hind wing, *Brenthis euphrosyne* with striated hind wing, a dull leaden *Agriades coridon*, etc.—Mr. Edelsten, a yellow form of *Cybosia mesomella* and a black and grey *Nisoniades tuges* from Chippenham Fen.—Mr. B. S. Williams, a series of the new Finchley form of *Dysstroma (Cidaria) truncata* and crosses between it and the usual black form.—Mr. A. W. Mera, species and hybrids of the genus *Oporabia*, *O. filigrammaria*, *O. autumnaria*, *O. dilutata* and its pale race *christyi*.—Dr. Leonard Hopper, the rare *Leucania extranea (unipuncta)* from Penryn, Cornwall, September, 1920.—Mr. A. E.

Tonge, Royston forms of *Agriades eoridon* and aberrations of many British species, including a male melanic of *Boarmia consortaria*, a confluent *Zygæna trifolii*, a male *Agriades thetis* with extra orange lunules on the hind wings, etc.—Mr. L. E. Dunster, bleached *Epinephele jurtina*, *Argynnis aglaja* with white marginal spots, *Aphantopus hyperanthus* ab. *arete*, an *Aricia medon* without orange markings, etc.—Mr. Johnston, aberrations of *Dryas paphia* and *Limenitis sibylla* from the New Forest.—Capt. Riley, the Scilly Islands race of *Epinephele jurtina*, much resembling the southern race *hispulla*.—Mr. H. E. Garrett, aberrations of British Lepidoptera, including *Rumicia phleas* with confluent spots on fore wing, *Euchloë cardamines* with dark hind margins to fore wings, etc.—Mr. H. J. Turner, two coloured plates folio with figures of the larvae of *Eupithecia assimilata* and *E. abbreviata*.—Prof. Poulton, F.R.S., a series of butterflies captured migrating from one valley to another and back again next morning, with their mimics, in Selangor. They were captured in March, 1920, and were *Delias* species, the mimics being *Euschemma* species. On behalf of Mr. J. J. Joicey, Mr. G. Talbot, a large number of new and little-known Lepidoptera from Central Ceram, Dutch New Guinea, French Guiana, Hainan Island, Peru and Brazil, with many striking and brilliant species, and a long series of aberrations of British Lepidoptera, including a gynandromorph of *Pieris napi*, *Colias edusa* ♀ with left fore wing ab. *helice*, with asymmetrical, unicolorous, streaked and melanic aberrations of varied series.—Messrs. O. R. and A. de B. Goodman, a set of series of British butterflies showing gradation of coloration and markings, and an American Hesperiid, *H. syrichtus*, from Surrey; also varied series of butterflies taken in July, 1920, in the Rhone Valley and around Courrnaye, Italy.—Mr. S. Edwards, mimetic species of *Papilio* and species of *Parthenos*.—Mr. Douglas H. Pearson, a large number of species and forms taken by him in the Pyrenees, including very dark ♀ *Melitea didyma*, the ab. *cleodoxa* form of *Argynnис cydippe*, *Parnassius apollo*, *Cænonymphia ædipus*, upper wing unspotted, *Lampides baeticus*, *Erebia lefebvrei*, *E. manto* race *cecelia*, *Heteropterus morpheus*, etc.—Mr. Robt. Adkin, the black ab. *chrysanthemi* form of *Zygæna filipendula* bred from a Lancashire larva, and *Melitea cinria* with intensified markings.—Mr. L. Tatchell, a photograph of a gynandromorph *Amorpha populi* from a Wanstead larva, larvae of *Dysstroma truncata*, and reported the pairing of a ♂ *Sphinx ligustri* with a ♀ *Smerinthus ocellatus*.—Mr. K. G. Blair, on behalf of Dr. Gahan, a larva of a *Nemopteron*, sp., from Syria, always found in dens on sand.—Mr. Jackson, a mixed gynandromorph of *Cosmotriche potatoria* bred from Oxford.—Mr. F. W. Edwards, a pair of the rare British gnat *Orthopodomyia pulchripalpis* reared from larvae from Epping Forest.—Mr. Bowman, a series of the forms of *Cosymbia pendularia* recently reared by him, especially ab. *nigro-subroseata*, in varied series of seven subordinate forms.—**Hy. J. TURNER, Hon. Editor of Proceedings.**

[Report received January 24th, 1921.—ED.]

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[No. 695

FOSSIL TIPULIDÆ FROM THE OLIGOCENE OF THE ISLE OF WIGHT.

By T. D. A. COCKERELL AND F. H. HAINES.

THE Tipulidæ now described were collected in the Bembridge beds at Gurnet Bay, Isle of Wight, and we are indebted to Dr. A. S. Woodward, of the British Museum, and Mr. R. W. Hooley, of Winchester, for permission to study and describe them. The Hooley Collection is at present deposited in the British Museum (Natural History). All the specimens now described were apparently collected by the late Mr. a'Court Smith, of Gurnet or Gurnard, Isle of Wight. He was the discoverer of the deposit, and his materials eventually found their way into the British Museum and the collections of Brodie, Hooley and Lacoe. Those from the last-mentioned collection are now in the United States National Museum; the others are in the British Museum, the Hooley Collection, on loan, with the understanding that the types will eventually become the property of the Museum.*

The most interesting species in the series now described is the *Macromastix*, representing a genus known living (with several species) only from Australia and New Zealand. It was recognised from our figure by Mr. F. W. Edwards, to whom we are greatly indebted for advice, and for access to literature and the collection of Tipulidæ at the Museum. The *Styringomyia* is also very interesting, the genus having first been known from amber and copal, and only in more recent years detected in the living fauna.

The genera of Tipulidæ found fossil in the Gurnet Bay material, but not here discussed, are: *Megistocera*, *Gymnastes*, *Empeda* (2 spp.), *Epiphragma*, *Limnobia*, *Mongoma* (2 spp.), *Atarba*, and *Rhipidia*. There are also additional species of *Tipula* (4), *Gonomyia* (3), *Limnophila* (3), *Dicranomyia* and *Styringomyia*.

* E. J. a'Court Smith was born in Buckinghamshire in 1814. When about 14 or 15 years of age he was wrecked on the Island of South Georgia, and was not able to get away for seventeen months. For many years he was a sailor (officer) in the service of the East India Company, and when the charter of the Company expired he served in the West Indian mail-boats. He was in the Crimean war. In 1859 he retired, and after a long residence in the Isle of Wight died in 1900. He corresponded with Ruskin, who presented him with a copy of Lindley and Hutton's 'Fossil Flora of Great Britain.' We are indebted to his sons, living at Yarmouth, Isle of Wight, for these particulars. It is greatly to be regretted that Mr. a'Court Smith did not live to see his splendid collections described.

Tipula hooleyi, n. sp.

Wing 21 mm. long and 6 mm. broad, hyaline with pale veins, but the end of costal and first marginal cells and the small second marginal broadly pale coffee brown; auxiliary vein joining R_1 at level of base of discal cell, about 15 mm. from base of wing; second marginal cell small, elongate kite-shaped, giving off an apparent cross-vein (really first part of first branch of R_{2+3}) before its middle below; two submarginal cells, the second extending considerably beyond the first at either end; discal cell elongate, five-sided, the two upper sides together forming a low arch, the side on third posterior cell equal to that on second basal, and considerably less than that on first basal; upper branch of fourth vein broadly forked, the cell thus formed about four times as long as its stem; fifth posterior distinctly contracted apically, its basal angle considerably produced.

Hooley Collection, 49. Among the Gurnet Bay fossils nearest to *T. limiformis*, Ckll., but with the basal corner of fifth posterior cell more produced. The fifth posterior cell is shaped practically as in the modern (much smaller) species *T. vernalis*.

The modern *T. lutescens*, which has a similar stigmatic spot, has the discal cross-vein much nearer base of discal cell.

When first preparing these descriptions we had used the old term "subcostal vein" for the so-called first vein of Schiner and Verrall. It seems better to refer to it as R_1 (first branch of radius), as the auxiliary vein is the true subcostal. The "second" vein is the R_{2+3} , and the "third" R_{4+5} . The fourth is the media (*M*), and the fifth the cubitus (*Cu*).

Holorusia vasifera, n. sp.

Length of wing 23 mm., breadth 6 mm., with a brownish tinge, immaculate, without stigmatic spot. Auxiliary vein joining R_1 at three-fifths of the length of the wing; R_1 joining costa at about four-fifths. Prefurca rising at a little beyond middle of wing almost opposite base of discal cell. The upper branch of the second (R_2) leaves the lower at rather beyond its middle, itself joining the costa a short distance beyond R_1 ; the marginal cross-vein is strongly rejected and comes off just beyond the furcation, joining R_1 at a distance from the costa rather more than its own length. The strongly-arched lower branch of the second vein (R_3), which is more than double the upper, joins the costa far before the apex. First marginal cell long and narrow, five times the length of the second; first sub-marginal very much broader than in *Tipula hooleyi*. The third vein (R_{4+5}) curves to the tip of the wing. Discal cell five-sided, rather egg-shaped, 2.5 mm. long, the facets on the first basal about double length of that on the second. Petiole of discal fork about one-fifth length of its upper branch, the branches diverging in a wide curve; the simple branch from the lower apical angle strongly curved so that the third posterior is somewhat contracted. Upper branch of postical fork almost parallel with lower, the fifth posterior cell being somewhat rectangular, not at all contracted apically, the

apex of the lower branch of the postical fork rather markedly curved near its apex; anal vein slightly curved, forming a narrow anal cell which is not very far open. Axillary vein and anal angle normal for *Tipula*.

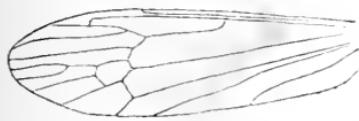
Hooley Collection, 9. Mr. Edwards points out that this should go in *Holorusia* rather than *Tipula*, on account of the expanded or vasiform second submarginal cell.



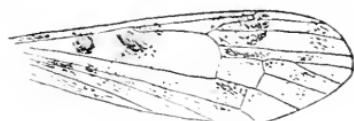
H49: *Tipula hooleyi*.



H9: *Holorusia rufifemorata*.



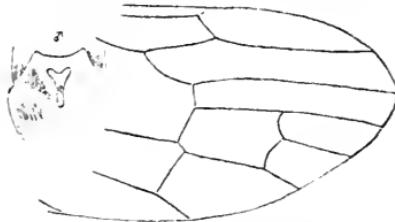
H1398: *Adelphomyia disjunctula*.



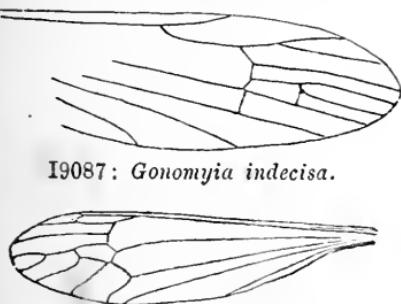
I9213: *Limnophila cyclops*.



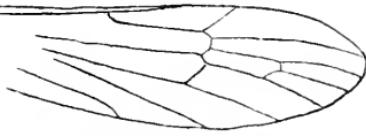
I9146: *Dicranomyia undulata*.



I9946: *Dicranomyia excavata*.



I9087: *Gonomyia indecisa*.



I10397: *Macromastix cladoptera*.

H261: *Styringomyia extensa*.

Adelphomyia disjunctula, n. sp.

Wing 8.5 mm. long, 3.2 mm. broad, hyaline, with a rather strong yellowish tint; veins testaceous, minutely hairy; costa with fine black hairs, subcostal vein much more densely hairy than the other longitudinal veins; axillary vein (Sc) ending rather obtusely in the costa beyond middle of wing, at about level of base of discal cell; R_1 ending abruptly nearly opposite middle of upper branch of second vein (R_2), not approaching costa, but connected with R_2 by a pale, hairless, somewhat oblique cross-vein. Präfurca originating about two-fifths of wing length from base, directed downward at its origin, but soon curving outward and taking a very straight course to level of end of axillary vein, when it forms a very wide fork, the upper

division of which ($R_2 + 3$) soon forks again, forming a very long cell, the apex of lower side of which is not far from tip of wing. Discal cross-vein at base of discal cell; first posterior cell not much shorter than second submarginal; discal cell six-sided, narrowed to the squarely truncate base, which is shorter than its side on the second basal; its upper apical face distinctly shorter than its lower; upper branch of fourth vein (M) with a broad fork forming a cell which is about twice as long as its stem. Apex of second basal cell forming a right angle and projected beyond first basal nearly half length of discal cell. Anal vein running close to the fifth for a considerable distance, then diverging somewhat from it. Axillary vein with a double curve, the second only moderately strong. End of axillary vein some distance basal of origin of praefurca.

Hooley Collection, 1398. Resembles *A. cayuga*, Alex., but has first branch of media forked as in *A. americana*, Alex., and is peculiar for the failure of R_1 to reach the costal margin. The discal cell is unusually short and high.

(To be continued.)

EFFECT OF THE EARLY SPRING OF 1920 ON BRITISH LEPIDOPTERA.

By A. W. MERA.

PERHAPS it would be as well before touching the Lepidoptera of the season to give a few details respecting the dates on which one or two of our common trees put forth their foliage in 1920 as compared with the three years before. These dates refer to the Epping Forest district.

OAKS.—(1) 1917: On May 6th the Forest was bare; by the 13th it had burst into leaf. (2) 1918: On April 28th were just bursting into leaf. (3) 1919: On May 2nd still bare, by the 15th were out, summer weather. (4) 1920: On April 14th a few trees in leaf.

BEECHES.—(1) 1917: On May 6th, on high ground only, a few trees in young leaf. (2) 1918: April 28th, just breaking into leaf. (3) 1919: May 1st, slightly leafy in places. (4) 1920: April 14th, in leaf.

BLACKTHORN.—(1) 1917: May 6th, just coming into bloom, and in full bloom by May 13th. (2) 1918: March 31st, some bushes out; in perfection by April 7th. (3) 1919: May 2nd, just out; by May 15th still out, but getting over. (4) 1920: March 11th, several bushes in blossom, and fully out on March 30th.

The Whitethorns were out particularly early, as I saw a few sprays of blossom as early as April 14th, although the bushes were not in full beauty until May 9th; but with this tree I had made no previous notes for reliable comparison.

By these dates it will be seen that this year was a particularly early season as regards vegetation, and it would appear that the

effect on Lepidoptera was hardly so pronounced as might have been expected. In no way can the season of 1920 be compared to the early season of 1893, when insects raced along, and in many cases were much dwarfed in consequence. In the present season things seem to have been equalised by the very sudden changes of temperature which were experienced. On May 25th, when the thermometer reached 81°, the summer seemed to have spent itself in a few days, after which we were subjected to occasional night frosts well into June. I was on the borders of Dartmoor during the second week of June, and there I saw that the young bracken had been blackened by frost, and again in Essex at North Weald on July 3rd much the same thing was to be seen, only that the bracken was of much older growth before being frosted. Some of the spring larvæ were early. *Hybernia defoliaria* was full grown by May 15. In Monks Wood the larvæ of *Thecla pruni* were about the same size as at the same date last year, and *Zephyrus betulae* were slightly larger, while *Trichiura crataegi* were smaller than in 1919. Generally speaking larvæ were scarce. By May 25th in Epping Forest the common *Hyberniidæ* larvæ were nearly over, and what were left were mostly ichneumoned.

Of the very early spring Geometers I have no unusually early dates to record, although there are records of *Phigalia pedaria* (*pilosaria*) appearing as early as the middle of January in the north of England. The first I saw was on February 1st at Chingford; the first *H. leucophearia* on February 6th at Crawley Down; *Apocheima hispidaria* on February 8th at East Grinstead. *B. strataria* was taken at Loughton on April 21st and *Tænicampa gothica* on May 5th at Bexley Heath, both of which are really late dates. I picked up a fine specimen of *Cymatophora ocularis* at Loughton on May 30th, which perhaps is somewhat early, and also *X. fluctuata* on April 19th, also early.

Commencing with the Pieridæ, there were one or two remarkably early records of *Pieris rapæ* in the 'Entomologist,' but the first one that I saw flying was not until April 25th, which of course is rather late than otherwise. In fact the species was not really numerous until May 9th. The other two "Whites" were in their usual abundance, but perhaps not in sufficient numbers to call forth any special comment, unless it was an unusually prolific second brood of *P. brassicæ* in early August at Loughton. There were also some very early records of *Euchloë cardamines* in the 'Entomologist,' but personally I saw nothing to call for special notice. Hibernated *Gonepteryx rhamni* were seen on May 15th by me, but as I have only seen one specimen during the autumn it would appear that the weather proved unsuitable for them. I have seen *Colias edusa* very sparingly at a quite normal date on August 14th at Mayfield, Sussex. As to the Fritillaries, those that I have met with have been out at about

their usual dates. In South Devon *Brenthis euphrosyne* was seen on June 9th in fairly good condition, and *B. selene* on June 9th and 10th in fine condition. *Argynnis adippe* I saw flying in a wood in Essex from July 8th to 13th, which dates are quite normal. The season has been very favourable to some of the Vanessidæ, particularly for *Pyrameis atalanta*. The first which I saw was on March 1st at Mucking, but as I was unable to catch it I am not able to state its condition. I saw specimens on June 7th and 23rd at Loughton, on July 8th at Wrabness, Essex (worn), on July 16th (very worn) at Loughton, and on July 17th (perfectly fresh), Loughton, and from July 31st onwards in abundance. Up to July 17th all the early specimens showed signs of old age. Personally I am not at all satisfied with the more recent idea that *P. atalanta* does not hibernate in this country. Certainly by the appearance of most of the early ones they must have hibernated somewhere. However disastrous the season may have proved to many species of Lepidoptera *P. atalanta* has flourished exceedingly.

I saw *P. cardui* on May 15th in Monk's Wood, Huntingdonshire, and also at Herne Bay on June 23rd, both apparently worn, but fresh autumn specimens, as far as I have seen, have been decidedly scarce, as I have only seen one, and that was in Buckinghamshire on August 25th. However, I hear from other entomologists that it has been quite common in places. *Vanessa io* I have met with generally, and at normal dates. *Aglais urticae* has been comparatively scarce, but I have seen a few both at Loughton and in Sussex. *Limenitis sibylla* I took in Essex from July 8th to 13th; by the last date it was almost over. Among the Satyriidæ *Pararge megera* turned up about the usual dates and in fair numbers. Some few years ago Prof. Meldola remarked in the 'Entomologist' how the Satyriidæ were gradually disappearing, particularly from the vicinity of towns, which fact was endorsed by most field entomologists. His reference was chiefly connected with *megera*, saying that, when a boy, this insect was seen every year in his garden at Leyton, and that it had long since disappeared for miles round Leyton. For some unaccountable reason this insect, for the last few years, has become decidedly more common again. Last year I saw one at Loughton for the first time after six years' residence in the district, and this year I saw it at Crawley Down in Sussex, where I had never seen it before, although I have been to the same place at the right time for at least the last ten years. I also took the insect in fair numbers at Mayfield in Sussex. The dates of appearance were normal. *P. egeria* (*egerides*) has also been fairly abundant in its more or less restricted haunts. I took it in Devonshire in June, and again on the Chilterns in August, which dates also are quite usual. *Epinephele tithonus* has also shown up well this season. It was on the wing for a long time. The

first I took was on July 8th at Mistley, Essex. After that I saw it at Crawley Down, Sussex, from August 6th to 18th, in good condition, and many of them struck me as being particularly large. The last dates are somewhat late for fresh specimens. They were undoubtedly in much larger numbers than I had ever seen them before in the same district. *Aphantopus hyperanthus* was also out for a long time. The first I took was on June 23rd at Blean Wood, Kent. After that it was abundant in Essex from July 8th to 13th, when it was getting wasted, and the last I saw was on August 6th at Crawley Down. This species I should say had been hurried up by the early season, in spite of the one late record. *E. jurtina* was out early. The first observed by me was on June 11th in Devonshire, and the first at Loughton was on June 22nd. It was still flying in a wasted condition at Crawley Down when I left on August 18th. On August 7th, and on the 13th, I took two perfectly clean specimens which contrasted in a very pronounced manner with the other more or less worn specimens flying round. These have all the appearance of a second brood. I see in South's 'British Butterflies' that it has been suggested before that the late clean specimens are possibly the result of a second brood, but that no direct evidence has been produced to prove it.

With the Lycaenidae my observations were greatly hindered by bad weather. It has certainly been a great year for *Chrysophanus phleas*. There was a second brood out by July 11th at Mistley, and during August and September they have been in evidence wherever I have been. *Polyommatus icarus* has been abundant also, but I have no unusual dates to record. The few *Agriades corydon* that I have seen would lead me to suppose that the species was not earlier than usual. I saw a fairly fresh specimen at Oxted on August 10th, and also a few fresh specimens on the Chilterns on August 25th, but on both these excursions the weather was against me. With the Hesperiidae I saw *H. malve* on May 22nd, and as late as June 22nd at Loughton, and I saw this species in Devonshire on June 10th and 11th. These are certainly not early records. *A. sylvanus* was seen by me on June 11th in Devonshire and on June 22nd at Loughton, and as late as August 8th at Crawley Down. *A. flava* was seen in Essex on July 14th, and at Crawley Down from August 6th to 18th, which is rather late than otherwise.

Finally, I should say that moths generally have been particularly scarce, but as I have been unable to carry out much night work I am hardly in a position to judge. However, it appeared to me that remarkably few Geometers were disturbed during my day rambles. The only time I tried ivy was on October 11th. It was a beautiful clump of blossom about two miles from Loughton, fully out, and to all appearance a favourable night, but the only insect that was beaten out was one *Plusia gamma*!

NEW FOREST NOTES AND CAPTURES, 1920.

By HUGH P. JONES.

(Continued from p. 71.)

Geotrupes pyrenaeus, *Elater sanguinolentus*, *lythropterus*, *elongatus* and *balteatus*. *Lampyris noctiluca* (the rain having little effect on the "glow-worm's" light, which, however, was not so much in evidence this year); *Callideum violaceum* and *C. variabile*, *Clytus arietis* and *C. mysticus*, *Rhagium bifasciatum*, *indigator* and *inquisitor*, *Necydalis (Molorchus) umbellatarum*, *Leiopus nebulosus*, *Prionus coriarius*. Also a few other "long-horns" requiring verification.

LEPIDOPTERA.—Moths seemed up to their usual numbers in June. *D. orion* was taken not uncommonly, I heard, but is scarce directly south of Brockenhurst—unfortunately my "sugar-ing" ground! Spring larvae were quite abundant in some enclosures, but I failed to beat *Z. quercus* anywhere but at Royden, where a dozen or so will occur on one tree, and perhaps no others within a considerable radius. *Hemaris fuciformis* and *H. tityus* were common in May, notably at Wood Fidley, where the former kept to the woods, its congener preferring the rides or the open spaces by the railway. For the purpose of obtaining eggs *in situ* I followed up a ♀ *tityus*, and found that she was not at all particular in her ovipositing, blades of grass, etc., being chosen quite as frequently as the food plant. Extrusion of the egg was quite a lengthy matter, the insect fairly sitting down to the work. Unfortunately, when I visited the same ground in August, wood-carts had been all over the place to avoid the mud in "drives." During the end of June, and a couple of fine days in July, I secured a fair number of minor forms of *I. sibylla* and *D. paphia*. Only one good *nigrina* intermediate of the former was taken, but in August I saw two others which were too worn for keeping, so left them to carry on the race (although probably most of the eggs had been deposited by that date). *Colias edusa* was common at Milford-on-Sea in August (as, I hear, all along the coast), a rather surprising circumstance considering the havoc the rain must have caused amongst the larvae. I did a lot of "beating" for autumn forest larvae, but took practically nothing, and had the same result at "sugar." *Catocala sponsa* was about the only visitor at Royden in July, where, finding that I was wasting expensive "treacle," I only painted six trees at long intervals, instead of the usual score or so, and found they produced just as good—or rather poor!—results.

ODONATA, ETC.—These were scarce after the rains. I found *Anax imperator* very plentiful in enclosures during June. *Brachytron pratense* turned up at Royden, where I also took *Cordelia aenea*. I am pretty certain that I saw *Gomphus vulgatissimus* near Setthorns enclosure, but most unfortunately missed

it. *Aeschna cyanea* was unusually scarce, and the heavy rains in July brought *Calopteryx virgo* to a very premature finish. Amongst other Neuroptera taken was the curious "snake-fly" (*Raphidia*). A few *Osmylus chrysops* (one at "sugar"), and a single *Nothochrysa capitata* (from G. Gulliver). With Orthoptera I did little. The "wood-cricket," *Nemobius sylvestris*, was plentiful by the side of rides in enclosures, together with *Tetrix bipunctatus*, and I turned up a few of the very fine bog "grass-hopper," *Mecostethus grossus*, at Denny Bog, and Norley Wood. Good "Longhorns" (*Locustodea*) were scarce. *Locusta (Phasgonura) viridissima* was not seen.

In a quiet little way it has been quite a *Cicadetta montana* year. Ramnore is the best-known place for this interesting insect, but it extends for several miles beyond that spot, as well as occurring in another locality. My first specimen was taken on June 5th, and after the lapse of a week several more were found (one in a collector's killing bottle !), and they continued to appear until the end of the month, empty nymph cases being fairly frequent. One hot morning they flew very wildly, but I obtained all I required from the ground, where, probably recently emerged, they attracted attention by a peculiar rustling sound, very similar to the noise made by the larger "dragon-flies" when resuming flight after a rest. For this reason *Anax imperator* frequently deceived me into thinking that *Cicadetta* was about.

Eastlands,
Lymington,
Hants.

LEPIDOPTERA IN PERTHSHIRE, 1920.

By F. G. WHITTLE.

EARLY in April I spent a week at Struan, where *Nyssia lapponica* occurred sparingly over a wide area. From ova obtained I secured a healthy brood of larvæ, which did well on *Myrica*, and duly pupated. From Struan I went to Forres, and in one of the numerous clearings in the Altyre Woods netted, April 17th, *Evetria logaea (duplana)*, Drnt. That interesting beetle *Thanasimus formicarius* was found on a pine trunk May 6th; *Eupithecia albipunctata* and full-grown larvæ of *Ortholitha plumbaria* on tops of *Ulex* on 7th; on 12th *Mamestra glauca* emerged (Rannoch larva). I left Forres for Rothiemurchus, and found, in plenty, the resinous nodules of *Eretria resinella*. *Eretria logaea*, Drnt., also occurred on ground very similar to that on which I took the species near Forres. A few days after this a disastrous fire swept over this spot, and must have been very destructive of bird and insect life. *Thera cognata* larvæ and pupæ of *Argyresthia arceuthina* were found on juniper on May 17th; *Stigmoneota dorsana* occurred on *Lathyrus montana*, var. *tenuifolia*, near the

path to Braemar, between Coylum Bridge and Alltdruie, on June 3rd, and *Eupithecia helveticaria* on fences; *Eucymatoge togata* was netted among spruce; on 10th *Epitheetis lathyri* and *Gelechia solutella*, the latter in plenty, variable and in fine condition; on 17th, larvae of *Plastenis subtusa* between aspen leaves, and *Hepialus fusconebulosa*, ab. *gallicus*; on 28th, a single example of *Cemostoma susinella*, flying among aspen, and *Lithocolletis heegeriella*. I wanted to spend a week or so at Blair Atholl for Glen Tilt, but found it so difficult to get suitable accommodation that I gladly accepted the offer of the one-roomed bungalow annexe to the Struan Inn, and was made most comfortable. I found, on July 2nd, a larva of *Aporophyla nigra*; on 4th a few *Gelechia acuminatella*; on 7th, in a lane by the side of the Tilt, larvae in hundreds of *Epermenia chærophyllella* on *Heracleum*; on 14th *Elachista bedellella*; on 15th *Perittia obscuripunctella* flying in some numbers up and down a wall that seemed to be bare of honeysuckle; on 19th, in Glen Tilt, *Ablabia argentana* and *Pselinophorus brachydactylus*. I looked for, but failed to find, the food-plant of the Plume. *Crambus myellus* was beaten out near the Tilt on the 21st. *Coleophora discordella* was taken near Struan Point on August 10th; *Zelleria saxifrageæ* occurred on *Saxifraga aizoides*; on 22nd *Depressaria pulcherrimella* occurred; on 28th, to my delight, through the kindness of a young friend, a fine example of *Crymodes exulis*, var. *assimilis*. Willie McIntosh, of Kirkealdy, who, with some of his relatives, was making ready for tea in the open, noticed that a moth was crawling away from a stone near which a fire was burning. He quickly gave it shelter in a match-box, when it did what is not always done in such cases—it settled down quietly, and reached me in faultless condition. *Plutella dalella* occurred September 9th on fences at Struan; that handsome and scarce Longicorn, *Saperda scalaris*, and *Phibalapteryx lapidula*, occurred on the 24th. After this things got so hopelessly bad that I returned home to find Southend revelling in sunshine such as I had not experienced during my six months' absence in Scotland.

7, Marine Avenue,
Southend-on-Sea.

SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

By F. C. WOODFORDE, B.A., F.E.S.

(Continued from p. 12.)

NOCTUIDÆ.

ACRONYCTINÆ.

Acronycta leporina.—A long series of ab. *bradyoporina*, Tr., from various localities. A very dark specimen ab. *melanocephala*,

Mansbridge, from North Staffs. There are three specimens without data of true *leporina*, one from the Hope and two from the Spilsbury Collections.

A. aceris.—A specimen of ab. *infuscata*, Haw., from the Spilsbury Collection, without data.

A. alni.—Series of 25, 13 of them with data. One from the Hope Collection is labelled with a reference to the 'Entomologist Intelligencer' of 1856, p. 108. Three N. Staffs bred specimens show a decided tendency towards melanism.

A. strigosa.—Series of 22. Two are labelled "Cambridge Fens, July, 1890, presented by W. Holland." Another from the Meldola Collection is labelled "Cambridge," but without a date.

A. auricoma.—Six specimens. One from the Meldola Collection is labelled "Sussex, 1894."

A. rumicis.—Two specimens of ab. *sulcicis* from N. Staffs, and one from Yorks from the Sellon Collection.

A. ligustri.—Series of upwards of 30, mostly with full data. Three ab. *coronula* taken near Oxford, from the Pogson Smith Collection, and one without data from the Hope Collection.

Arsilonche albovenosa.—Nineteen specimens. Six labelled "Cambridge." The rest without any data.

Bryophila perla.—Series of more than 100 with full data, among them a very beautiful yellow specimen taken in the Isle of Wight by the late Capt. R. W. Poulton. A series of more than 20 from the Meldola Collection, from various parts of Scotland, are larger and more strongly marked than the average of English specimens.

B. muralis.—A long and very varied series with full data from S. Devon, Wiltshire, Isle of Wight and Sussex.

B. impar.—Six specimens from Cambridge presented by Mr. J. Peed.

TRIFINÆ.

Agrotis segetum.—A long series with some fine aberrations.

A. vestigialis.—In the series are eight specimens taken near Oxford, at an inland locality in which it regularly occurs. They differ slightly from the type.

A. cinerea.—A very varied series of about 40, all but one males. Two specimens from Wyre Forest have a brownish ground colour.

A. cursoria, *A. nigricans*, *A. tritici*, *A. aquilina*, *A. exclamacionis*, *A. epsilon*, *A. ripæ*.—Long series of each of these species exhibiting almost every form of variation.

A. obelisca.—Series of 40 from Devon, Isle of Wight and Purbeck.

A. præcox.—Series of 34, 17 with data, from the Isle of Wight, Cheshire and Lancashire.

A. simulans.—Seventeen specimens. Six from the Meldola Collection with data, viz. 4 Aberdeen, 1 E. Lothian, 1 Portland. The others without data.

A. agathina.—Series of 50 from Somerset, Dorset, Hants Surrey and Carnarvonshire.

A. obscura.—About 30—6 Oxford, 3 Yorks, 3 Essex. The rest without data.

A. hyperborea.—A varied series with full data. Twenty-three from Rannoch, 1 from Shetland.

A. ashworthii.—Twenty-eight from Penmaenmawr with full data. Nine without data from the Hope and Spilsbury Collections. One of the Hope specimens is labelled "H. Doubleday."

Noctua subrosea.—Twelve specimens. Three or four of them are in bad condition; the rest more or less worn.

N. flammatra.—A specimen from the Sellon Collection labelled "Cummings Collection."

A. glareosa.—A long series from many localities in England and Scotland.

N. castanea.—A long series of grey and red forms, both English and Scotch. There are two specimens of a pale ochreous yellow approaching var. *xanthe*, Wdfde., both from the Burnt Woods N. Staffs. One was presented to the Collection by the Rev. G Hughes, the other by the Rev. C. F. Thornewill.

N. depuncta.—Fifteen specimens, but only three have data. One from near Reading, taken by Mr. W. Holland. Another from the Meldola Collection labelled "Exeter, 29.7.02." A third from Forres.

N. ditrapezium.—Twelve with data. Four of them from Brighton; the others from Scotch localities.

N. primulae.—A long series from English localities. Twenty-nine var. *confusa* from Aberdeenshire, Ross-shire and Nairn. Two var. *thulei* from Shetland, presented by Commander J. J. Walker.

N. dahlii.—Series of 8 from the New Forest, 12 from N. Staffs, 22 from various Scotch localities.

N. sobrina.—Series of 20 from Aberdeenshire.

Triphaena orbona (subsequa).—Series of 30 with full data from Dorset, the New Forest and Canterbury.

T. comes.—A long series, including more than 20 of the dark Scotch forms. A remarkably fine specimen of var. *rufa*, Tutt, taken by myself in N. Staffs, is as dark as any Scotch example.

Eurois occulta.—Fifteen specimens from Scotland with full data. Two taken in Essex, August, 1869, from the Meldola Collection, are recorded in the 'Entomologist,' vol. iv, p. 325.

Aplecta tincta.—A fine series with full data, mostly from N. Staffs and Scotland.

A. nebulosa.—A long and very varied series. Eight ab. *robsoni*, 4 of which were presented to the Collection by Mr. B. H. Crabtree and 4 by Messrs. Main and Harrison. Four ab. *thompsoni* were also presented by Messrs. Main & Harrison and 1 by Mr. B. H. Crabtree.

Mamestra contigua.—Ten with full data from Surrey, from the Champion Collection. A very fine dark specimen labelled "Rannoch" from the Tautz Collection (bought at Stevens).

M. glauca.—Seven with full data from Staffordshire. Twenty from various Scotch localities; 6 of them, from Aberdeen, presented by Mr. A. Horne.

Dianthœcia barrettii.—A very varied series of over 50 with full data. Of these 23 were bred by myself from larvæ found in the Bude district on *Silene maritima*, and 16, also bred by myself, from larvæ found on *S. maritima* in S. Devon. Five specimens from S. Ireland bred by Mr. L. W. Newman. One of the Bude specimens has a distinctly ochreous tinge.

D. cœsia.—Series of 19, 12 with data, from Douglas, Isle of Man.

D. conspersa.—Series of over 50 from various localities in England, Wales and Scotland, with full data. Two specimens in a series of 10 bred from Carnarvonshire larvæ approach the dark Shetland form *hethlandica*, Staud., of which last there are 5.

D. albimacula.—Eighteen with data; 16 from Folkestone, 2 from S. Devon.

D. carpophaga.—A fairly long and varied series with full data. Twelve ab. *capsophila* from the Isle of Man.

Dianthœcia irregularis.—Five from Cambridge, presented by Mr. E. D. Bostock. Twelve from Suffolk, presented by Mr. B. H. Crabtree.

Hecatera chrysozona.—Nineteen specimens, but only one with full data. This is from the Meldola Collection, and labelled "On post, Darenth Wood, 12.7.73."

Neuria reticulata.—Series of 40, mostly from Dorset and Suffolk. The rest from various localities.

Pachetra leucophœa.—Series of 28 with data. All from Wye, Kent, except two labelled "Mickleham, Surrey, July 14, 1856."

Xylomyges conspicillaris.—Series of 20, mostly var. *melaleuca*, Vieweg. Fifteen labelled "Taunton." Two from the Chitty Collection labelled "Wales 1888." One from the Meldola Collection labelled "Worcester."

Eumichtis satura.—This rarity is represented by one specimen from the Sellon Collection labelled "*H. satura*, Oxford, Harper's Collection." It is possibly the specimen referred to in Barrett, vol. iv, p. 113.

Crymodes exulis.—Six specimens, five with data. Three from the Meldola Collection are labelled "Rannoch." One, in poor condition, from the Sellon Collection, is also labelled "Rannoch." Another presented by Mr. J. Peed, by whom it was taken, is labelled "Unst. July 23-31, 1914."

(To be continued.)

NOTES ON BRITISH ORTHOPTERA, 1920.

By W. J. LUCAS, B.A., F.E.S.

FORFICULODEA (earwigs).—It is satisfactory to note that *Labidura riparia*, Pallas is still with us. On the shore near Southbourne, Hants, after a search of considerable length on August 31st, I succeeded in finding two examples. They were a nymph of pale colour in a well-advanced stage, and a large male imago perhaps slightly darker in colour than usual. The former when uncovered on the sand did not move, and it being of so pale a tint I did not notice it at first. The latter when exposed was on its back, and so it continued to lie as if dead; but when put into a box it turned its callipers over its back and assumed the "threatening" attitude. Both were found under the usual conditions on a slope of soft sand near the foot of the cliff. The nymph seemed rather afraid of the male, so at home, wishing to observe them for a while, I thought it best to put them in separate receptacles. On August 31st a little cooked beef was given, which the nymph attacked at once; but the male assumed the "threatening" attitude, though he shortly afterwards attacked his piece also. He was very ready to take up this peculiar attitude; the nymph I noticed do so but once. On September 2nd the male ate ripe plum a little, but apparently did not care for it; the nymph I did not see touch it at all. Later in the day they both devoured boiled turbot—the nymph a little, the male a considerable amount. On September 4th I gave them a little raw meat, which the nymph attacked readily: I did not see the male eat any, but on September 7th they both ate this provender readily. On September 10th I gave them some kipper, thinking that, from their habitat, fish would be suitable food; perhaps, however, the preservative in it was not to their liking, for they did not seem to care for it.

With regard to *Forficula auricularia*, Linn. it would be of interest to make certain to what extent the male hibernates as well as the female. On October 10th (which, however, was not very late) I took a male in Juniper Valley, Boxhill, Surrey. On the North Downs between Newland's Corner and Guildford I caught on October 17th one or two females, a rather pale-tinted male, and somewhat to my surprise a nymph, which, however, was probably in its last stage. These were the last specimens I met with during the season. An example of the variety *forcipata*, Steph. was taken in the Royal Horticultural Society's Gardens at Wisley, Surrey, in 1920 (Fox-Wilson), and a pronounced example of the same variety on July 21st at Blakeney Point, Norfolk (Green).

From H. Donisthorpe I received for inspection an example of *Forficula auricularia* devoid of callipers. This earwig he took by sweeping near Wokingham, Berks, on September 2nd, 1920.

It was kept alive more than four months, being killed on January 9th, 1921. The pygidium is well developed, but on each side of it, where the callipers should appear, are simply two blunt points, which are not even visible in a direct dorsal view. This most odd-looking insect I take to be a male from the structure of the last segment.

BLATTODEA (cockroaches).—Several specimens of the indigenous cockroach, *Ectobius lapponicus*, Linn., were seen on June 9th at one spot on Hackhurst Downs, Surrey. After securing a dark specimen I found that the others had sought safety in hiding. On June 26th one was taken at Ramnor, in the New Forest, and on September 8th a female was secured near Holm Hill (Lucas). The species was taken at Camberley, Surrey, on June 18th, and on August 7th, 29th and 30th (Green). Two females of the variety *nigripes*, Steph. of *Ectobius panzeri*, Steph. were taken on the slope of Holm Hill in the New Forest on September 4th (Lucas). *Blatta orientalis*, Linn., *Periplaneta americana*, Linn., and *P. australasiae*, Fabr. were found in 1920 at the Royal Horticultural Society's Gardens, Wisley, the set including at least one nymph of *P. americana* (Fox-Wilson). On July 29th I received from E. A. C. Stowell a *P. americana*, with rather uniformly tinted pronotum, which was brought to him at Alton, Hants, just before that date. It was found in a hot-house and apparently had been imported with orchids. On November 26th in the warm reptile house at the Zoological Gardens in the afternoon a cockroach (clearly *P. americana*) was seen trying to get at a piece of biscuit (presumably thrown into the tank for the crocodiles !) This was beside a tiny island of stone, while between it and the cockroach were four or five inches of very shallow water. The insect clearly was aware by some means that the biscuit was desirable provender and, after some evident reluctance, crossed (its legs only being in the water) to the coveted prize and fed upon it heartily. A leaf in the middle helped it to ford the narrow strait. The incident was interesting as revealing a considerable amount of resourcefulness in the cockroach.

GRYLLODEA (crickets).—On March 17th in a damp situation a fine example of *Gryllotalpa gryllotalpa*, Linn. was found in a cottage garden at Send, near Woking in Surrey; while on July 7th a further example, a female, was caught in a cottage garden in the same village. The length of the latter from the head to the tip of the abdomen was 4·5 cm. (Fox-Wilson). Near Rhinefield in the New Forest on May 27th I met with a number of nymphs of *Nemobius sylvestris*, Fabr., the largest being about half-grown. I saw no adults. Some time later, on July 2nd, I took a male in the Forest, but it was still a nymph. There are always plenty of imagines in the Forest in August, the late summer being apparently the normal time for adults.

In the warm tortoise-house at the Zoological Gardens crickets were chirping merrily in the afternoon of November 26th. I could see none, but an attendant said that numbers were in the house. Presumably they were *Gryllus domesticus*, Linn. In dwelling-houses this cricket seems undoubtedly to be getting less common; in fact it is necessary to revise our estimate of its frequency.

LOCUSTODEA (long-horned grasshoppers).—In August three male imagines and a female nymph of *Metrioptera brachyptera*, Linn. were taken on Studland Heath, Dorset (Stowell). Female imagines—one on September 7th and one on September 9th—were secured in the New Forest (Lucas), while on the latter date two female imagines were taken at Bearsted in Kent (Green). *Conocephalus dorsalis*, Latr. was found to be in great abundance at Studland Heath in August, and a male imago and two female nymphs were captured (Stowell); while the species was reported as fairly common at Wicken Fen on August 15th (Lyle); a female sent thence came through to me alive. *Leptophyes punctatissima*, Bosc., *Meconema thalassinum*, De Geer, and *Metrioptera brachyptera*, Linn. were taken in 1920 at the Royal Horticultural Society's Gardens at Wisley (Fox-Wilson).

ACRIDIODEA (short-horned grasshoppers).—In the New Forest on May 21st a mature female of *Tetrix bipunctatus*, Linn. was taken of a nearly uniform yellowish-grey colour, the two spots from which its name is derived being scarcely visible. It was taken mature at Horsley, Surrey, on June 12th (Lucas). The species was captured in the Royal Horticulture Society's Gardens at Wisley in 1920 (Fox-Wilson). *Gomphocerus rufus*, Linn. was found of a rosy tint in Juniper Valley, Boxhill, Surrey, on October 10th. *G. maculatus*, Thunb. was taken there on the same day; it was first met with mature, female, on June 21st in the New Forest (Lucas). On September 10th I went in search of *Mecostethus grossus*, Linn. to Silverstream Bog in the New Forest. I saw but few; they were small and perhaps all males, the two I captured certainly being of that sex. *Plusia gamma*, Linn. kept flying up and deceiving one at the moment, though the mistake was soon discovered, since *M. grossus* flies in a straight line while the moth does not. The next day no examples were seen at Duck-hole Bog. *Stenobothrus lineatus*, Panz. was met with on one occasion only—in Juniper Valley, Boxhill, on October 10th (Lucas). *Omocestus rufipes*, Zett., female, was noted on September 20th in the New Forest (Lucas). *O. viridulus*, Linn., female, was found mature in the New Forest on June 21st (Lucas). On August 8th, female, and on September 12th, male, the species was found at Rainow in Cheshire (Neave). *Stauroderus bicolor*, Charp. was taken on the White Horse Hill near Sutton Poyntz in Dorset on September 29th. Both sexes of quite a dark grey tint were found at Esher Common on October 7th; the species was found there again on

October 11th, while a female was taken at the same place on October 25th with ruddy top of head and dorsal surface of thorax, the latter being pale-edged, the dorsal surface of the closed elytra being rather pale also (Lucas). Of *Chorthippus elegans*, Charp. a female was taken at Studland Heath in August (Stowell). Its commoner congener, *Ch. parallelus*, Zett., of both sexes, was found mature in the New Forest on June 25th (Lucas). It occurred at Lochgilphead, Argyllshire, in August (Morton). It was reported, male, on September 12th at Rainow (Neave). Both sexes were obtained in the New Forest on September 20th. In Juniper Valley, Boxhill, it was taken of a rosy tint on October 10th (Lucas). It was found to occur in the Royal Horticultural Society's Gardens at Wisley in 1920 (Fox-Wilson).

Kingston-on-Thames;
February, 1921.

NOTES AND OBSERVATIONS.

MELITÆA ATHALIA, ROTT., AND M. PSEUDATHALIA, REVERDIN.—Dr. Reverdin has carried his investigations of the male appendages of *M. athalia* to a definite conclusion that the species hitherto passing under this name must be divided. *Athalia* is, in fact, a "portmanteau" species, as was found also by him to be the case with *Hesperia malvae*, and has long been suspected, but I believe not yet established, with *M. phœbe*. In other words, a hitherto unknown species, which he now names *pseudathalia*, exists quite commonly over certain areas west of the great central alpine *massif*, and as at present determined south of the Juras, and (?) the valley of the Loire. A full account of the discovery with woodcuts of the respective male appendages is published in the 'Bulletin de la Société entomologique de France,' 1920, No. 19, and was communicated to the Society at their meeting on December 8th last. Dr. Reverdin states that his inquiry was stimulated by Mr. Sheldon's publication of the male *athalia* armature published in the 'Entomologist's Record,' 1916, p. 261, pl. iii, and our congratulations, therefore, are due also to Mr. Sheldon, with whom Dr. Reverdin has been in correspondence since he took the matter in hand. Fortunately the discovery entails no change of the nomenclature of our English *athalia*, which is identical with von Rottemburg's species, nor does the new species extend to our islands. At present Dr. Reverdin does not claim to have discovered characters whereby to distinguish the two species superficially, and it now remains to initiate a series of breeding experiments to ascertain what differences are apparent in the earlier stages. *Athalia* has ever been something of a puzzle to those of us whose observations have been made on the Continent. It is only by the collation and comparison of long series that it is possible, in my opinion, to arrive at a fair conclusion otherwise than by dissection of the appendages. But, just as a long series of *H. malvae* and *H. malvoidea* in the cabinet presents to the eye an obvious but difficult-to-define distinctiveness

in *fresh* examples, so I hope it may be possible, once the range of distribution of *athalia* and *pseudathalia* is ascertained, to separate them also one from the other. Dr. Reverdin states that he has no record of the two species occurring together; further, that the black markings of *athalia* appear to be much more accentuated and dominant than in *pseudathalia*. Collectors abroad this year, or those who have accumulated duplicates on the Continent to any extent, will greatly assist Dr. Reverdin by providing him with additional material for his researches. Examples already examined from localities east of the central European Alps to the Amur and Japan are so far identified with the true and original *athalia*.—H. ROWLAND-BROWN; Harrow Weald, February 5th, 1921.

DISAPPEARANCE OF AGRIADES CORYDON AB. SYNGRAPHA FROM THE CHILTERNNS.—May I express my appreciation of Mr. Rowland-Brown's remarks under the above heading in your February issue. It is unfortunately true that the gentleman with the "coal sack" has been too much in evidence during the past few years. It is almost unnecessary to refer to the extinction of *Chrysophanus dispar* and the sadly diminished numbers of *Papilio machaon*, but it would appear that unless something can be done many other species are likely to disappear from their favourite localities. A few instances from my own little experience may not be out of place in this connection. Some years ago I, in company with two other enthusiasts, made an attempt to establish *P. machaon* in a certain locality in the Essex marshes. A number of pupae were "planted" in a spot where food-plant was abundant, and the whole surroundings approximating to *machaon*'s habitat in Fenland. That many imagines did emerge is certain, for in one week a farm-hand brought two males to me which he had knocked down with his hat. The following week several more were taken in the district. The matter was noised abroad, and despite our appeals that *machaon* might be respected for at least one season, in a short time the neighbourhood was over-run by every "collector" within reach. The project was, possibly, a little ambitious, but I feel convinced that, given a sporting chance, *machaon* might have established a colony in a new locality. Again, when on leave from France in the summer of 1916 I was fortunate enough to discover *Thecla w-album* in considerable numbers in a hitherto unsuspected locality in Kent. In this case history repeated itself. Last summer, when roaming around in the county last referred to, I was much surprised to see a fine specimen of *Aporia crataegi*, which I duly netted. Two more were seen within half-a-mile of the spot. From general observation in this district I am sanguine that *crataegi* is making a determined effort to extend inland, and in this case I am emulating Brer Rabbit.—F. HOWARD LANCUNY; "Fernside," Shepherds' Lane, Dartford.

A NEW NON-CORROSION PIN.—There is no need to emphasise the advantages of a pin which will not corrode or "verdigris" in use or when in contact with cork carpet, sour paste and the various substances now used to preserve our collections. The necessity for such a pin is felt more by micro-lepidopterists than by collectors of other orders, because of the small size of the pins they use and the short

time it takes to complete the destruction of a specimen once verdigris sets in. Pins made of silver wire—or rather, alloy, mainly silver—have hitherto given complete satisfaction, but the supply has ceased and our stocks have given out. Under these circumstances lepidopterists will be pleased to hear of a cheap and efficient substitute for silver. A year ago I found a wire which possesses all the advantages of silver as regards corrosion ; it is of a dark grey colour, much cheaper than silver, and in addition it is of sufficient stiffness for the purpose intended. My experiments show the wire to be perfectly free from attack by the fatty acids in moth grease, and further, there is no action by organic acids in general. Most lepidopterists are aware that verdigris is formed on the pins in our cabinets by the action of the fatty acids, mentioned above, upon the copper in the brass pins generally used. I have supplied several of my friends with the new wire at various times during the last season ; they have pointed it themselves and report favourably as regards its use. My own stock of silver pins is now exhausted, and I am having some made from the new wire for use during this coming season. The great difficulty is to find somebody to point the wire ; dealers tell us that their efforts in this direction meet with no success. Lepidopterists, like other people, dislike change, but if those who study only the Macros would demand an improved pin it would soon be to the advantage of a manufacturer to produce it, because the quantity required would make it worth while. As there seems to be very little chance of getting pins made for us in time for the coming season, I am obtaining a sufficiency of the wire of diameter suitable for Noctuae, Geometridæ and the various Micros, and shall be ready to supply those who wish to try it. The price cannot be stated at present, as it is not my intention to make a profit ; it will depend upon the thickness of the wire, which will be wound on bobbins of one ounce for the larger sizes and on half-ounce bobbins for Micro sizes. In conclusion, I shall be delighted to hear from anyone who will seriously consider making these pins for the market.—W.M. MANSBRIDGE ; "Dunraven," Church Road, Wavertree, Liverpool.

[I have tried Mr. Mansbridge's non-corrosive wire and find that it resists all tendency to verdigris, so far as I have been able to apply the tests, and think it is a very good substitute for silver pins. The great difficulty, as Mr. Mansbridge says, is getting the pointing done. Last year I pointed several hundreds of pins with the aid of a small file, but this is a very laborious process. I am told that by using an emery or carborundum wheel this labour can be much reduced ; personally I have not yet acquired the knack of doing this, but one of my friends informs me he does not find any difficulty. He has certainly put most excellent points on about 200 pins for me.—W. E. SHELDON.]

BUTTERFLY NOTES FROM CUMBERLAND.—I found 1920 a poor year for insects in general, some of the orders—Hemiptera, for instance—being extremely scarce. Butterflies, as was to be expected in such a wet summer, were, with few exceptions, uncommon. Most of my observations were made near Carlisle, on the borders of the Solway Firth, or on the south-west coast near Drigg, where I spent a fortnight

in July. *Pieris brassicae*, *P. rapae* and *P. napi* were scarcer than usual, especially *brassicae* in the second brood. *Euchloë cardamines*, as a rule a common species in our lanes and marshy fields, was not so in 1920, but I got two nice, undersized males. I saw very few ova. *Iglais urticae* was fairly common after hibernation in the spring, but I saw few broods of larvae as the season went on, except near Seascale, where, in one lane, the nettles were reduced to bare stalks by a large congregation, obviously the product of several females. *V. io*, now-a-days a rarity here, I did not meet with, but heard of two examples in different parts of the county. I saw one *Pyrameis cardui* in May down the Solway, but did not again meet with the species. On the other hand *P. atlantica* was fairly common and continued late into October, when the weather was really better than in the summer. *Argynnis aglaja* was abundant near Drigg on the rough ground behind the sandhills. I was pleased to find a new locality for *Brenthis euphrosyne* at the end of May. This is a scarce and more local butterfly in Cumberland than *B. selene*. The latter, however, was not so abundant as usual. *Hipparchia semele* was on the wing while I was at Drigg, favouring lanes and hedgerows as well as the sandhills. It also was far from being as common as usual. *Pararge megæra* occurred commonly in the spring brood, the August emergence being much less pronounced. *Epinephele jurtina*, of course, was common, and seemed little affected by the adverse season. *E. tithonus*, a very local butterfly in Cumberland, and largely confined to the southwest of the county, I was too early for when at Drigg in July, and only one specimen was seen. *Aphantopus hyperanthus* was decidedly scarcer than in other years, and I saw few varieties of note. *Cano-nympha tiphon* was in bad condition when I noticed it in June on one of its favoured mosses. *C. pamphilus* was another usually common species which seemed to find the season an unfavourable one. *Callophrys rubi* was fairly frequent on Cunwhitton Moss. *Chrysophanus phleas* was scarce but *Polyommatus icarus* common, and I got one fine example of var. *cærulea* of the female. *Nisoniades tayes* was, if anything, commoner than usual, but local, while our only other Cumberland skipper, *Augiades sylvanus*, was seldom seen.

—F. H. DAY: 26, Currock Terrace, Carlisle.

COLIAS EDUSA, ETC., IN HAMPSHIRE.—While staying at Milton, Hants (about six miles east of Christchurch), last August I took fifteen specimens of *Colias edusa*, and I have heard that others took it there also about the same time. Most of those I took were very worn, some badly chipped, but six, four ♂ and two ♀, were quite fresh. I kept one worn ♀ alive in a muslin cage over a potted clover plant. She lived for about a fortnight, and then died without having laid any eggs. The ground above the cliffs, for several miles each side of Milton, is covered with rough grass, clover and trefoil, the flowers of this last seeming especially attractive. The butterflies appeared to travel along the coast from east to west. From August 6th to the 12th I saw only two specimens of *Colias edusa*. On the 13th I took one and saw two others, and I met another entomologist who had taken several that morning about a mile east of Milton. On the 14th I took six and saw many others at Milton.

On the 15th I took eight and also saw others about a mile west of Milton, whereas I saw none nearer Milton, although I was on the look-out for them. Has any other reader noticed this kind of coastal migration in this or any other species? I also found *Pyrameis cardui*, *P. atalanta*, *Hipparchia semele* and many other species very abundant in this part of Hampshire.—W. H. PALMER; 192, Selsdon Road, South Croydon, Surrey, February 19th, 1921.

CHRYSOPHANUS PHLEAS, VAR. CÆRULEO-PUNCTATA, ON DRY GROUND.—Towards the end of May, 1919, I came across a colony of *C. phleas* in a grassy clearing on Croham Hurst, a wooded hill near Croydon. Although only a few of these were really well-marked var. *cæruleo-punctata*, almost all had a greater or lesser amount of blue on the underwings. It may be remembered that May, 1919, was an exceptionally hot and dry month; also Croham Hurst is composed chiefly of gravel and chalk and rises well above the surrounding land. I therefore found this blue-spotted form in an exceedingly dry spot, whereas Mr. J. C. Melvill ('Entom.', vol. liv, p. 17) and others found theirs in damp places.—W. H. PALMER; 192, Selsdon Road, South Croydon, Surrey, February 19th, 1921.

POLYGNIA C-ALBUM IN GLOUCESTERSHIRE IN 1920.—I have just come across Miss Coney's account ('Entom.', vol. liv, p. 78) regarding *Polygnia c-album*, and perhaps the following may be of interest to your readers: During the early part of last September I was at Withey Beds Camp, near Stroud, Gloucester, and one warm, sunny afternoon, as I was reading, with my net alongside in case anything turned up, I saw something below me which seemed uncommon. On catching the insect I discovered it to be *Polygnia c-album* in perfect condition. I may add that this was my first capture of this butterfly.—J. H. VICKERS; 16, Talgarth Mansions, Barons Court, London, W.

SESSA CULICIFORMIS FORCED.—Last September I collected three larvae of *S. culiciformis*, and placed them in a tin box which contained a living larva of *C. cossus*. The latter larva ate two of the former; the remaining one formed a cocoon of sawdust. It was then put in a forcing cage (temperature about 55°) and a fine ♂ emerged on February 27th.—G. H. HENSHALL, Eltham, S.E.

PHIGALIA PEDARIA MONACHARIA.—On February 14th I took a good specimen of *Phigalia pedaria* ab. *monacharia* on a lamp-post, and saw another the following night on a wall. Winter moths are quite common this year.—WALTER PIERCE; Queen's Road, High Wycombe.

TORTRICES FROM RANNOCH, BRED.—Certain pupæ resulting from larvæ obtained in the Rannoch district in 1919, and which did not emerge in that year, produced moths in the spring of 1920. They included two female examples of *Philedone prodromana*, one of *Lophodera politana*, and several of *Peridrina dimidiata*; they all came from larvæ feeding upon *Myrica gale*. I was much surprised at the emergence of *L. politana*; the larva which produced it did not at all agree with that described of this species. I had an hour to wait at Rannoch Station on my return home in August, and to pass away the time I strolled across a piece of bog near by on which there

was growing a luxuriant crop of *M. yale*. A *Tortrix* larva was common on this, which agreed, so far as I could see, with those of *Peronea maccana*, which I had been taking a few weeks before at Camghouran, and I put it down to be that species, but to make sure took away one larva, from which, to my surprise, emerged a specimen of *L. politana*.—W. E. SHELDON.

PERONEA CRISTANA, ERRATA.—In my paper on this species, on p. 16 of the present volume of this magazine, I say that ab. *sequana*, Curtis, requires eliminating from the list in favour of ab. *combustana*, Duponchel. This is an error. My friend, Mr. J. H. Durrant, points out to me that Duponchel did not give the name *combustana*, but adopted it from Hübner, who used it for a form of *hastiana*, Duponchel wrongly applying it to a form of another species, *cristana*. Curtis's name of *sequana* should therefore stand, and ab. *combustana*, Duponchel, must fall as a synonym of it. On p. 38 I find that ab. *lichenana*, Curtis, is omitted; it, of course, should appear. I make its position to be after ab. *sub-chantana*, Clark, in Group 2.—W. E. SHELDON.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—December 9th.—The President in the Chair.—Mr. J. J. Joicey, F.E.S., The Hill, Witley; Mr. G. Talbot, F.E.S., The Hill Museum, Witley; Mr. A. J. Wightman, 35, Talbot Terrace, Lewis; and Mr. L. Ford, Park Hill, Bexley, were elected members.—Mr. Sperring exhibited a Cassid, *Aspidomorpha*, sp., from Central Uganda.—Mr. Main made a series of remarks on the keeping of ants in artificial formicaria.—Mr. A. A. W. Buckstone, further series of dwarf *Agriades coridon* from Surrey, and a second brood of *Euphyia picata*.—Mr. Bowman, aberrations of *Polyommatus icarus* from Folkestone.—Mr. B. S. Williams, *Bithys quereis* ab. *major* from Cornwall and an asymmetrical *Cenonympha pamphilus*.—Mr. Goodman, a pupa of *Hyles euphorbiæ* from a Courmayeur larva.—Mr. K. G. Blair, ab. *parvipuncta* of *Rumicia phleas*.—Mr. R. Adkin, a series of *Ptychoptoda dimidiata* (*scutulata*) with their cocoons, and read notes on the pupation, showing the natural position to be among rubbish on or near the surface of the ground.—Mr. Hy. J. Turner, a small collection of butterflies from W. Java.—Mr. Adkin, the Society's delegate to the Conference of the British Association, read a short report of the meeting.

January 13th, 1921.—Mr. K. G. Blair, B.Sc., President, in the Chair.—Lord Rothschild, of Tring, and Mr. F. W. Eefer, of 2, Blackheath Vale, were elected members.—Mr. R. Adkin exhibited a *Margarodes unionalis* taken near Abbot's Wood, Sussex, and gave notes on the occurrence of this interesting migrant.—Mr. Blenkarn, local species of Coleoptera, including *Henotius germanicus*, Craven House, Strand, *Necrophorus interruptus*, Box Hill, *Cassida hemisphaerica*, Chiswick, four species of *Hydroporus* from Coathbridge, etc.—Mr. Hy. J. Turner, a box of butterflies sent to Mr. Sperring by our member Mr. G. B. Pearson from California, including fine series of the spring gen. *galactinus* of *Cenonympha californica*, of the dark

Melitaea, *M. chalcedon*, a *Papilio rutilus*, *Anthocharis sara* forms, *Colias eriphyle*, summer form *erytheme*, *Brephidium exilis*, one of the smallest butterflies of the world, (*Lycæna*) *avalon*, only found in S. Caterhina Island, S. California, several *Hesperiidae*, etc., and read a communication on the exhibit from Mr. Pearson.—Mr. T. H. L. Grosvenor, *Papilio glycerion*, and its races and allied forms from Sikkim and Thibet.—Mr. B. S. Williams, *Lycæna arion* from Cornwall.—Messrs. H. Main and A. E. Tonge, photographs of items in life-histories of common insects and ova of Lepidoptera respectively.

January 27th.—The President in the chair.—Annual Meeting.—There was a large attendance. After the formal business was completed, the President, Mr. K. G. Blair, read his address "Insects in Winter," and votes of thanks were passed. Ordinary Meeting.—Mr. Step exhibited a large locust found alive at large in Covent Garden with a small crowd of timorous watchers around.—Mr. Coppeard, a series of colour forms of the water-plant beetle *Donacia sericea*.—Mr. Turner, a box of Rhopalocera sent from near Port Elizabeth, South Africa, including the cosmopolitan *Lampides boeticus*, a fine series of the Satyrid *Leptoneura clytus* and species of *Pieris*, *Terias*, *Teracolus*, *Mycalesis* and *Pamphila*.—Mr. Lucas, the Neuropteron, *Hemerobius stigma*, now common on Esher Common.—Mr. Leeds, 177 different forms of male *Polyommatus icarus* named from the descriptions given in J. W. Tutt's 'British Lepidoptera.'—Hy. J. TURNER, Hon. Editor of *Proceedings*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, November 15th, 1920, the President, Mr. S. P. Doudney, in the Chair.—Mr. G. H. E. Hopkins, Shevington Vicarage, near Wigan, and Mr. A. R. Davidson, Foster Road, Formby, were elected members of the Society.—A paper was read by Mr. S. Gordon Smith, F.E.S., entitled, "A Year's Collecting of Macro-Lepidoptera." In this most interesting paper Mr. Smith related his experiences in pursuit of Lepidoptera from the autumn of 1919 until October of the present year. Delamere Forest came in for a good deal of attention, and by persistent hard work Mr. Smith has obtained some lovely sets of variable insects; he showed that *Nyssia hispidaria*, previously considered rare in the forest, was quite a common insect, and had further established, by counting a large number of moths on the trees, that *Phigalia pedaria*, var. *monarcharia*, occurred in the proportion of about one to three of the type in this locality. A large part of the paper was taken up with the results of breeding; large numbers of the larvae of the *Vanessidae*, in particular, passed through the cages and yielded some fine varieties. Probably the most interesting section of the paper was that dealing with the visitors to electric light. The author had installed a 2000 candle-power lamp on the balcony of his house overlooking the river Dee and the flat, open country beyond. Records of temperature and weather were kept and their bearing on the number of insect visitors noted. *Thamnoctoma brunneata*, *Acronycta alni* and its black variation, *Cirrhædia cerampelina* and *Dicranura furcula* were among the species that came

to light. A discussion ensued, in which Prof. Newstead, the Rev. F. M. B. Carr and Mr. Wm. Mansbridge took part. A vote of thanks was carried by acclamation.—Mr. Carr exhibited a variable series of *Peridromia saucia*, also *Xanthia ferruginea*, *Calocampa exoleta* and *C. vetusta*, all taken in his garden at Alvanley on sugar and rotten fruit; from Prince's Risboro' a series of *Thera juniperata*.

ANNUAL MEETING, December 20th.—The President in the Chair.—The following were elected as officers and council for the ensuing year, viz.:—President: R. Tait, F.E.S. Vice-Presidents: J. W. Griffin, F.E.S., S. Gordon Smith, F.E.S., S. P. Doudney, H. M. Hallett, F.E.S. Hon. Treasurer: J. Cotton, M.R.C.S., etc. Hon. Librarian and Assistant Secretary: C. P. Rimmer. Hon. Secretary: Wm. Mansbridge, F.E.S. Council: A. W. Hughes, R. Wilding, W. Webster, F.R.S.A.I., Hugh Main, B.Sc., F.E.S., L. West, M.I.M.E., A. W. Boyd, M.C., F.E.S., A. R. Jackson, M.D., D.Sc., W. J. Lucas, B.A., F.E.S., B. H. Crabtree, F.E.S., A. Newstead, F.E.S., Rev. F. M. B. Carr, E. F. Studd, M.A., F.E.S.—The President read an address entitled, "The Lepidoptera of Wicken Fen"; he also exhibited series of insects in illustration.—Other exhibits of Fen insects were made by Messrs. Wm. Mansbridge, C. P. Rimmer and S. Gordon Smith.—Mr. J. B. Garner-Richards, The Liverpool Collegiate School, Shaw Street, Liverpool, was elected a member of the Society.—WM. MANNSBRIDGE, Hon. Sec.

SOUTH WEST YORKSHIRE ENTOMOLOGICAL SOCIETY.—At the invitation of Mr. B. Morley, the members of this Society held their annual meeting at his house at Wind Mill, Skelmanthorpe, on January 16th last. There was a good muster of members, and a large number of lepidopterous duplicates were exchanged. At the conclusion of the Society's business the following exhibits were passed around: By Mr. E. G. Bayford: Orthoptera—*Periplaneta australasiae*, F., from Barnsley; Coleoptera—*Anthrenus museorum*, L., from Leeds.—By Mr. T. H. Fisher: Coleoptera—*Leistus fulvibarbis*, Dej., *Ocys harpaloides*, Serv., *Ontholestes murinus*, L., *Staphylinus pubescens*, De G., *Corymbites pectinicornis*, L., *C. cuprens*, F., and var. *aeruginosus*, F., *Nylotenus domesticus*, L., and *Blaps mucronatas*, Latr., from the Skelmanthorpe district. Mr. Fisher also showed the following Lepidoptera: A series each of *Bombyx* var. *calluna*, from Penistone Moors, *Pieris napi* and *Scopelosoma satellitia* from Skelmanthorpe district.—By Mr. G. T. Porritt: Specimens of the newly separated *Paedisca sinuana*. *Sciaphila penziana* from Grassington, taken by Mr. W. G. Clutton in 1911, the first Yorkshire specimen. An almost clear white specimen of *Spilosoma menthastris*, specimens of the rayed form *walkerii* and the brown form from North Scotland. Scottish and English specimens of *Melanippe hastata* along with a fine suffused variety from near Huddersfield.—By Dr. H. D. Smart: A long series of English and Irish *Pieris napi* of both spring and summer broods showing a wide range of variation.—By Mr. J. Hooper: *Argynnis* var. *valesina*, also confluent *Zygaea trifolii* from the New Forest, and *Melanargia galathea* from the Isle of Wight.—By Mr. E. Cocker: A brown suffused variety of *Aretia caia* from Huddersfield district.—The evening was spent looking at the Morley Collection of Lepidoptera.—B. MORLEY, Rep. Sec.

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NEW FORMS OF SPHINGIDÆ.

By J. J. JOICEY, F.E.S., F.L.S., ETC., AND G. TALBOT, F.E.S.

THE types of the forms herein described are in the Hill Museum. We are obliged to Dr. K. Jordan for his valued opinion on forms 1-5. Figures of these forms will be published when opportunity permits.

1. *Oxyambulyx ceramensis*, sp. nov.

Allied to *wildei*, Misk., from Australia and New Guinea, but distinguished by the larger rounded sub-basal spot on the fore-wing and the more strongly marked underside. May only be a race.

♂ ♀. Upper side with the coloration of *wildei* but somewhat darker. Fore wing with a very large sub-basal spot. The sub-marginal line below vein 3 farther from the margin than in *wildei*. The sub-apical line from costa to sub-marginal line strongly marked. Hind wing with discal line more heavily marked than in *wildei*, the anal patch darker, and marginal line more strongly developed and much darker. Underside with darker markings than in *wildei*, and sub-marginal line of fore wing further from the margin. Hind wing with markings as above. Head, thorax and abdomen with the same coloration and markings as in *wildei*.

Length of fore wing: ♂ 51 mm., ♀ 57 mm.

Hab.—Mount Manusela, Central Ceram, 6000 ft., October-December, 1919, C., F. & J. Pratt, 1 ♂, 1 ♀.

2. *Clanis pratti*, sp. nov.

Named after Mr. James Pratt, the youngest of the three brothers who collected in Ceram, and whose first collecting trip it was.

Allied to *bilineata*, Walk. Distinguished by the distinct triangular costal patch of the fore wing and the absence of any chocolate-brown coloration on the hind wing. Fore wing broader, outer margin not incurved.

♂. Upperside of fore wing darker ochreous than in *bilineata*. Triangular costal patch grey-white suffused with pinkish, sharply defined, outer edge longer than it is in *bilineata* and crossing vein 7 beyond its point of origin. Outer crenulate post-discal line farther from the margin than in *bilineata*, the inner line not defined above vein 6. Hind wing dusky ochreous, blackish basally, and paler at the

margins. A slight lilac suffusion at the anal angle. Underside slightly darker than in *bilineata*. Fore wing with shorter black stripe below the cell, apical patch grey white, faintly pinkish. Hind wing with the outer two post-discal lines less distinct and becoming obsolete posteriorly.

Length of fore wing: 64 mm.

Hab.—North Manusela, Central Ceram, 2500 ft., March, 1919, C., F. & J. Pratt, 1 ♂.

This specimen was bred from a larva brought in by natives. "For about two weeks it barely moved, making no attempt to eat or search for food. On December 30th we put it in a box with earth. It immediately burrowed, and did not cast its skin until early in February. The imago emerged on March 5th."

The larva is briefly described by Messrs. Pratt as follows: "The larva is green with five lateral ridges the whole length of the body. It is covered with tiny protuberances, forming a rasping surface."

Pupa.—The pupa-case was sent and may be described as follows: It is 60 mm. in length and 17 mm. in diameter at the wing-cases. Proboscis sheath reaching about to the tip of the wing-cases. The eighth and ninth segments show a slight and broad protuberance on the ventral side. The cremaster is broadly triangular, 3 mm. at the base and 2 mm. long.

3. *Clanis hawkeri*, sp. n.

Quite distinct from any other in the genus. Fore wing with apex not pointed, outer margin slightly rounded. The palpi are smaller and shorter than in other species, and the second segment is more concave. The hind wing has the discocellulars more oblique. We hesitate to make a new genus for this species, though it may possibly be distinct, but further material of this or other species with similar characteristics is desirable.

♂. Upper side of fore wing vandyke brown, with oblique transverse bands of darker brown with grey-white discal and basal suffusion. A sub-basal line, a second line crossing the wing at vein 2, both edged with grey white on the inside; a discal line crossing the wing at origin of vein 3, broader in cellule 2 and not reaching the submedian; a post-discal line, strongly marked from the origin of vein 6 to vein 4, where it curves inward and is indistinct to the submedian; a second post-discal line, less distinct, from base of cellule 6 to vein 4, and bordered with a grey-white suffusion on each side; a heavily marked sub-apical band, anteriorly broad at vein 7, and reaching vein 5. These lines or narrow bands are not well defined and are diffuse on their edges. An indication of greyish longitudinal stripes in cellules 2-4. Hind wing dull red brown, with a marginal border of grey brown, darker anteriorly. Inner margin creamy white. Underside of fore-wing pale ochreous brown, the basal half red brown like the hind wing above. Distal margin grey white with a pink tinge, this colour produced as narrow stripes in cellules 2-5. The outer three bands of

the upper surface are faintly marked. The apex is reddish brown. Hindwing pink irrorated with grey white more especially in the basal half and on inner margin. A thick, slightly curved discal line of darker red between veins 8 and 3; a more faintly marked dentate sub-marginal line from costa to anal angle, slightly angled at vein 5. Antennæ dirty grey. Head blackish brown, greyish at the sides. Palpi with outer part of second and third segments blackish brown, inner half of these segments and segment 1 chocolate brown. Collar blackish brown. Patagia vandyke brown irrorated with grey white. Abdomen grey brown above, below paler tinged with pink. Segments above darker at the base and narrowly ringed with golden orange. Pectus grey white, tinged with pink. Fore- and mid-femora grey white tinged with pink, tibiæ and tarsi blackish brown. Posterior femora and tibiæ grey white tinged with pink.

Length of fore wing: 26 mm.

Hab.—French Indo-China, 1 ♂.

4. *Pachygonia ribbei peruviana*, sub-sp. nov.

Pachygonia ribbei, Druce, Biol. Cent. Amer., Het., 1, p. 4, pl. i, f. 2 (1881) (Chiriqui).

♂. Differs from typical *ribbei*, Druce, in the darker brown coloration of the upper surface, especially of the hind wing, where, however, the lines are more distinct. The underside is more ochraceous than in the typical form and the post-discal line of the fore wing is narrower.

Hab.—Rentema Falls, Upper Maranon, N. Peru, 1000 ft., A. E. Pratt.

5. *Nephele leighi*, sp. nov.

Distinct from any other known form in the genus, but resembling *æquivaleens*, Walk., in the absence of black patches on the abdomen. The hind tarsi are, however, shorter than in this species.

Upperside with ochreous-brown ground-colour. Fore wing in basal lower part dark greenish ochreous. An oblique darker brown discal band, not very distinct; a similar post-discal band, anteriorly broader and ill-defined, slightly angled at vein 3; an irregular faint post-discal line. A very irregular sub-marginal line marking off a darker distal area which is evident in cellules 4 and 5; a second sub-marginal line divides the narrow ochreous-brown marginal from the inner blackish-brown area, which is slightly dusted with grey. Hind wing dark greenish ochreous; distal margin deep brown, narrowing posteriorly. Underside paler ochreous brown. Fore wing with the dark marginal area well marked. Hind wing with three not strongly marked discal lines, the middle one about midway between the others, and only distinct to the submedian. Head, palpi and pectus grey as in *æquivaleens*. Antennæ grey white above, brown below. Thorax dark greenish ochreous. Abdomen pale ochreous without markings. Legs pale ochreous.

Length of fore wing: 41 mm.

Hab.—Mahe, Seychelles; G. F. Leigh, 1913, 1 ♀.

We have taken the liberty of naming this after Mr. Leigh, who collected in the Seychelles in 1913 on behalf of Mr. Joicey.

6. *Theretra clotho manuselensis*, subsp. nov.

Distinguished from the typical form by the post-discal line of the fore wing being incurved to the costa near the apex.

♂ ♀. Post-discal line of fore wing incurved near apex, forming a sharp angle with a short oblique line from the costa. This is more strongly marked in female specimens. The underside ground colour is more reddish than in the typical forms. Abdomen with black basal patch reduced in the majority of specimens.

Described from a long series from Mount Manusela, Central Ceram, 6000 ft., October–December, 1919, C., F. and J. Pratt.

7. *Theretra clotho papuensis*, subsp. nov.

This form may have something to do with *incarnata*, R. & J., regarded from the point of view of colour, but as we are unable to find any factor pointing to specific distinction from *clotho*, we prefer to treat the form as a race of that species. A study of the genital armature of *clotho* and the allied forms is necessary to clear up the obscurity surrounding these at present.

The form *celata*, Butl., was regarded by Rothschild and Jordan as a race of *clotho*. It is of interest to record the existence of this form on Ceram and in Dutch New Guinea in company with *clotho*. This suggests that *celata* is a distinct species.

♂ ♀. More nearly allied to the Ceram form than to the typical one. The black abdominal basal patch is obsolete or absent. Fore wing either dull greenish grey or pinkish testaceous, in the former case with much paler more greyish sub-basal and distal area. The dark oblique line is mostly separated from the apical line and is joined to a short costal line as in the Ceram form. Pale discal lines obsolete or absent. Hind wing anal patch more pinkish than in typical form. Underside pinkish grey thickly speckled with black. Fore wing with black basal area washed with grey, distal marginal area only slightly paler than the ground-colour. Hind wing with discal lines not clearly defined. Legs and underside of body more pinkish than in the other forms.

Hab.—Wandammen Mountains, Dutch New Guinea, 3000–4000 ft., November, 1914, A., C. & F. Pratt, 6 ♂♂, 4 ♀♀; 6000 ft., 1 ♀.

8. *Cechenea helops interposita*, subsp. nov.

This form presents the characteristics of the typical form on the upper side, but is more like *papuana*, R. & J., below.

♂ ♀. Upperside coloration and markings as in the typical form. Fore wing with fringes as in typical form, black basal patch

more extended along the margin. Hind wing with anal patch sharply defined on the outer edge, between which and the margin there is no pale scaling. Underside with the pinkish-ochraceous coloration of *papuana*. Fore wing with costal spot joined to a large apical patch continued to vein 6 as a heavy curved spot, which encloses a small marginal spot of ground-colour. Hind wing with distal dark marginal band broader than in the typical form but less so than in *papuana*. Discal band broader than in typical form. The anterior femora with blackish-grey hair as in *papuana*. The second and third dorso-basal abdominal grey patches smaller than in the other two forms. No sharply defined pale lateral patch on segments 4 and 5.

Hab.—Mount Mansuela, Central Ceram, 6000 ft., October-December, 1919, C., F. & J. Pratt, 5 ♂♂, 7 ♀♀.

NOTE ON CHANGE IN SYNONYMY.

Cechenea sumatrensis, Joicey & Kaye, Ann. and Mag. Nat. Hist. (8), xx, p. 307 (Sumatra), 1917.

This species has been examined by Dr. K. Jordan, who pronounces it to be a specimen of *Theretra boisduvali*, Bagn.!

Timoria concolorata, Kaye, Ann. and Mag. Nat. Hist. (9), iv, pp. 93-94 (Tenimber), 1919.

The genus *Timoria* was described as new, but both must sink to *Heisea luctifera*, Walk.

We are obliged to Dr. K. Jordan for this correction.

FOSSIL TIPULIDÆ FROM THE OLIGOCENE OF THE ISLE OF WIGHT.

By T. D. A. COCKERELL AND F. H. HAINES.

(Continued from p. 84.)

Limnophila cyclopila, n. sp.

Wing about 7 mm. long and 2·5 mm. broad, R_1 ending on costa at about level of end of discal cell; *præfurca* arising a short distance before middle of wing, running rather close to *subcosta*; second and third veins (branches of R) separating normally, the second two-branched, forming a very long cell with a very short petiole, the first submarginal being thus a little shorter than the second. A cross-vein from near end of R_1 to second vein (R_2), the first marginal cell longer than the second; discal cell unusually high, subquadrate, the basal corners approximately rectangular, the apex emitting three veins, the first forked, the fork somewhat longer than the stem, the second rather nearer to the first than to the third. Second basal cell much longer than first, its apex not far from the end of discal cell. Anal area reduced; axillary vein straight and close to margin. Wing yellowish with dark fuscous spots; elongate spots near base in costal, second basal, and first anal cells; three round spots successively larger and further apart on upper part of wing, the first above the light

interval in second basal cell, the second around the origin of the *præfurca*, and the third around the basal part of the first *submarginal* cell and extending in more diffused form to end of *præfurea*; the apex, region of discal cell and below it, and practically the whole of second basal and anal cells except a light interval towards the base strongly dusky; the lightest areas of the wing (appearing conspicuously whitish) are about the middle of the *præfurea* and the middle of the *submarginal* cells.

British Museum, I 9213. In having end of second basal beyond middle of discal cell this resembles *L. noræangliae*, Alex., and *L. irrorata*, Johns. In having marginal cross-vein nearly at end of R_1 it resembles *L. lutea*, Doane. It is easily recognised by the beautifully spotted wings.

Dicranomyia undulata, n. sp.

Wing hyaline and immaculate, with fuscous veins, elongate, the apex being rather acutely rounded; length about 6 mm., width 2 mm. Auxiliary vein ending acutely on the costa very slightly before its middle, just before the origin of the *præfurea*. R_1 ending in a similar manner at level of discal cross-vein. The strongly-arched *præfurca* is given off from R_1 at about the middle of the wing slightly beyond the level of the end of the auxiliary vein, and after a short course divides into the second and third veins, the fork being broad at base. Two marginal cells, divided by a very oblique vein directed backward from the second vein; the second marginal somewhat longer than the first. The third vein terminates at exact tip of wing, being curved somewhat downward before its end. Discal cross-vein present, somewhat oblique, reaching the fourth vein near its separation from the fifth, the fourth (*M*) and fifth (*Cu*) being connected for a short distance by anastomosis. The lower branch of the fifth runs out with a slight curve to the border. The sixth vein is straight, seventh vein with a double curve, the second very strong. The anal angle is well marked. The fourth vein is forked less than half way between the discal cross-vein and the apex of the wing, the fork broad. The first basal is longer than the second by the breadth of the apex of the second.

British Museum, I 9146. A peculiar species, remarkable for the open discal cell and short second basal. The absence of the vein separating discal cell from third posterior is very unusual in the genus, but Osten Sacken found this character in some specimens of *D. pubipennis*.

Dicranomyia excavata, n. sp.

♂. Length of body about 5 mm., ferruginous; wing 5·7 mm. long, 1·3 mm. wide, tinged with ferruginous, especially in the apical region: veins pale, ferruginous, R_1 ending about 1·3 mm. from tip of wing. Origin of *præfurea* not visible, owing to loss of a portion of the middle of the wing, but from the direction the visible part takes it is far beyond middle of wing, apparently about 2 mm. from apex; it is very short, soon dividing into the second ($R_2 + 3$) and third ($R_4 + 5$)

veins. Second simple, angulated at a little less than a third of its length, where it is joined to the end of R_1 by a long, oblique cross-vein, directed backward; terminal part of second straight, third before discal cross-vein strongly curved, its course beyond nearly straight, reaching tip of wing. Discal cell deep, six-sided, but its face on second basal very short; its apex emits three simple veins, the second a little nearer the first than the third. The base of the second and third posterior cells distinctly concave; second basal cell extending a little beyond corner of discal, its apical face oblique; sixth vein ending far from fifth, seventh (axillary) strongly curved downwards at end. Genitalia shown in figures.

British Museum, I 9946. Resembles *D. pulicaria*, O.S., but second basal cell as in *D. pubipennis*, O.S.

Gonomyia indecisa, n. sp.

Wing slightly over 6 mm. long. 1·7 mm. broad, hyaline, not reddened, with very pale yellowish veins; humeral cross-vein distinct. Costal vein deeper than usual, R_1 ending acutely on margin a short distance before forking of præfurca, auxiliary apparently absent. Præfurca strongly arched, originating about middle of wing, curving downwards to make a very broad marginal cell. The second vein forked, forming a widely open submarginal cell, the upper side of which is about twice as long as the stem and the lower side about twice as long as the upper; third vein ($R_4 + 5$) nearly straight, ending very slightly above the tip of the wing. Discal cell elongate and five-sided, emitting three simple veins from its apex, but the vein separating the third posterior cell from the discal is extremely weak and hardly visible, so that, without close scrutiny, the discal appears not to be closed; the second posterior has an angular base much shorter than the base of the third; second basal cell equal in length with the first, its apex scarcely beyond base of discal. Sixth vein widely separate at apex from fifth; seventh a little curved, entering margin a little before origin of præfurca.

British Museum, I 9087 (Brodie Collection). Rather like *G. affinis*, Brun., but R_1 very much shorter, second basal larger, and discal cross-vein not approaching fork of præfurca. Differs from the other Gurnet Bay fossil species by the closed (though indistinctly) discal, but especially by the much shorter R_1 .

Macromastix cladoptera, n. sp.

Wing 9·3 mm. long, 2·5 mm. wide, narrowing to a petiole basally, without any anal lobe, as in *Dolichopeza*; wing hyaline, apparently darkened along the fifth vein and the veinlets of the apical field, but there is a diffused iron stain on the fossil, which makes the true coloration doubtful. Apex very obtuse. Auxiliary vein not clearly visible, apparently entering R_1 near base; R_1 terminating a little over 2 mm. from tip of wing. Præfurca remarkably short, arising 3·5 mm. from tip of wing, forming a very acute angle, giving off the third ($R_4 + 5$) before middle of first marginal cell. Second vein ($R_2 + 3$)

simple, but emitting a very oblique rejected vein to subcosta very near its tip; third vein directed downward to a point just above apex of wing; discal cross-vein reaching discal cell very near base. Discal cell elongate, six-sided, having a very short face on fifth posterior cell, its face on first basal cell nearly twice as long as that on second basal, its oblique apex emitting only two veins, the first of which forms a wide fork, the stem of which is almost as long as its lower side; fifth posterior cell contracted just before apex, owing to the curve in the lower branch of the fifth vein (*Cu*), the basal corner of the cell only moderately produced. Sixth vein straight except at extreme tip, the anal cell not contracted apically; axillary vein straight except at extreme tip, remote from anal, running practically parallel with the margin.

British Museum, I 10397. The small upper section of second vein was thought to be absent, but on close scrutiny it can be seen, obscured by an iron stain. It is present in all the living species, but often colourless and very faint.

Styringomyia extensa, n. sp.

Length about 4·5 mm., width about 1·3 mm., hyaline, faintly yellowish, with very pale slender veins; costa with rather long delicate hairs. R_1 running into costa at an extremely acute angle near middle of wing; præfurca arising a little over a third from base of wing, strongly curved at base, but then running a straight course beyond end of R_1 , when it separates into second ($R_2 + 3$) and third ($R_4 + 5$) veins, which are both simple, the second directed obliquely upward, forming an angle of about 45° with costa and ending far before wing-tip, even before level of middle of discal cell; third extremely long, running a slightly arched course to a point above tip of wing. Discal cell extremely long and slender, the base on first basal oblique and equal to that on second basal, the apex emitting three simple veins, side on second posterior short, that on third posterior twice as long, very oblique, and slightly arched inwards; end of second basal cell oblique, taking the same direction as the end of first basal on discal. Sixth vein (A_1) straight, diverging from fifth and ending far from it; seventh (axillary) gently curved at end, terminating a short distance beyond origin of præfurca, but before level of end of R_1 .

Hooley Collection, 261. Differs from *S. ceylonica*, Edw., by having the axillary complete to margin, and lower side of second posterior cell all straight, as well as the longer discal cell. This is considerably larger than the *styringomyia* already recorded from Gurnet Bay, and differs in the details of the venation.

THE MACRO-LEPIDOPTERA OF COUNTY TYRONE.

BY THOMAS GREER.

(Continued from p. 35.)

Euplexia lucipara, L.—Abundant generally at sugar.*Phlogophora meticulosa*, L.—Common throughout the county.*Mormo maura*, L.—Kane states that this species is abundant at Corkhill; not uncommon locally among old willows near Lissan, Tullylagan and at Stewartstown.*Nenia typica*, L.—Abundant at grasses and sugar.*Helotropha leucostigma*, Hb.—Locally abundant in bogs and marshes; var. *fibrosa*, Hb., being fine and distinctly marked, varying from pale red to a dark red-brown.

Hydræcia (Gortyna) crinanensis, Burrows.—A recently discovered species which seems only to occur in the North of England and Scotland, and in Ireland altogether replacing the familiar *nictitans* (so far as is at present known). Abundant and widely spread on marshy ground and stream sides, the imago resting on scabious and ragwort in the daytime, but more plentifully after dark. A very variable insect, the darker forms being more abundant near Lough Neagh. Mr. Kane (referring to the species then known as *nictitans*) remarks: "On the sandhills and fens which border the Wicklow coast I have found typical *nictitans* to be the almost exclusive form, and out of a series sent to Mr. Tutt he only noted one var. *paludis*. On the other hand, I last year took a long series of nothing but var. *paludis*, except two var. *lucens* at Mote Park, Co. Roscommon. At Favour Royal I had a similar experience" ("Catalogue of the Lepidoptera of Ireland").

Hydræcia (G.) lucens, Pierce.—Often abundant on moorlands and bogs, Altadiawan (K.), on ragweed near Cookstown (H.); at Lough Fea it frequents the bogs on the higher ground, but does not descend to the damp meadows alongside the lough, where the preceding species is found in abundance.

Hydræcia (G.) micacea, Esp.—Abundant on waste ground almost everywhere; var. *brunnea*, Tutt, not uncommon.

**Ochria ochracea*, Hb.—Prof. J. W. H. Harrison discovered the pupæ of this species in thistle stems near Cookstown.

Nonagria typhæ, Hb.—Abundant generally in the county among *Typha*.

Tapinostola fulva, Hb.—Common in marshes and damp meadows, the red (type) form not rare locally.

† At the sale of Mr. Tutt's Collection this series, or a portion of it, was purchased by Dr. A. E. Cockayne, who writes ('Entom. Record,' vol. xxiv, p. 73) that the Rev. C. R. N. Burrows had examined the species, which consisted of eighteen *crinanensis* and thirteen *lucens*.

‡ These specimens have since been identified as forms of *lucens*, and it is very doubtful as to the occurrence of *paludis* in Ireland.

* *Calumia lutescens*, Hb.—Often abundant in reed beds near Grange and at Stewartstown; var. *rufescens*, Tutt, not rare in the former locality.

Lucania pallens, L.—Very abundant, a fine red form.

Lucania impura, Hb.—Abundant everywhere.

Lucania (Cirphis) comma, L.—Common and widely spread in the county in marshes; several ab. *suffusa*, Tutt.

Lucania (Sideridis) lithargyria, Esp.—Abundant at grasses; ab. *ferrago*, Fab., not uncommon.

Lucania (Chabuata) conigera, Fb.—Several captured at dusk by Prof. J. W. H. Harrison in lanes near Cookstown.

Grammesia trigrammica, Hufn.—Kane found this species scarce at Favour Royal; fairly common at sugar and light in this district; var. *obscura*, Tutt, by no means rare.

* *Stilbia anomala*, Haw.—This species (which is generally rare inland in Ireland) is locally abundant on a small area of rocky moorland below Lough Fea; the males large and distinctly marked, and the females nearly black.

* *Caradrina morphæus*, Hufn.—Rather rare at grasses locally near Stewartstown and at Killymoon.

Caradrina taraxaci, Hb.—Kane mentions Co. Tyrone as a locality for this species; abundant at grasses locally.

Caradrina quadripunctata, Fb.—Very abundant almost everywhere.

Petilampa arcuosa, Haw.—Generally abundant in the county in damp localities, varying from white to a brown-banded form.

* *Rusina tenebrosa*, Hb.—Not uncommon locally at sugar, at Lissan and near Killymoon; at bladder campion at Grange.

* *Amphipyra pyramidea*, L.—This species seems to have considerably extended its range in this country in recent years, as Kane states that "single specimens at Howth and Lissadell, Co. Sligo, mark its northern limits on the east and west"; in this district it is often common at sugar in woods near Killymoon and at Loughry; also at Stuart Hall, where a fine dark-banded form occurs.

Amphipyra tragopoginis, L.—A very common species.

* *Panolis piniperda*, Panz.—Not very abundant; several at Killymoon and Tamnamore, of a dull red form.

Pachnobia rubricosa, Fb.—Favour Royal (K.); often abundant at sallows near Lough Fea, where grey and brown forms are common; always rare in cultivated districts.

Tæniocampa gothica, L.—Abundant at sallows; var. *gothicina*, H. Sch., at Lough Fea.

Tæniocampa stabilis, Hufn.—Abundant generally, varying from pale grey to a brownish black.

Tæniocampa incerta, Hufn.—Common in woodlands. The following aberrations occur: ab. *instabilis*, Fab.; *cærulescens*, Tutt; *nebulosus* and *fuscatus*, Haw.

Tæniocampa munda, Esp.—Locally abundant at Favour Royal (K.), also at Killymoon, near Stewartstown, and in the Lough Neagh district, the prevailing form being ab. *rufa*, Tutt, although ab. *pallida* and *grisea*, Tutt, are common.

**Tæniocampa opima*, Hb.—Locally common at Lough Neagh; a few near Stewartstown; var. *brunnea*, Tutt, not rare in the former locality.

Tæniocampa gracilis, Fb.—Abundant generally in damp localities; var. *rosea*, Tutt, almost as common as the pale form; a banded aberration of the latter has the median area suffused with dark scales, several approaching var. *rufescens*, Cockl.

Calymnia trapezina, L.—Kane gives Favour Royal and near Stewartstown as localities for this species; it is also not uncommon near Tamnamore and at Killymoon, where reddish varieties occur.

**Dyschorista suspecta*, Hb.—Locally common at heather blossom near Tamnamore, and at Killymoon on ragwort, in the forms *congener*, Hb., *rufa* and *nigrescens*, Tutt.

**Cirrhœdia (Atethmia) xerampelina*, Hb.—Not abundant; a few at rest on ash trunks near Stewartstown; several at street lamps, Dungannon.

Amathes (Orthosia) lota, Clerck.—Common at ivy bloom.

Amathes (O.) macilenta, Hb.—Abundant at sugar and ivy bloom.

Amathes (O.) circellaris, Hufn.—Very abundant.

**Amathes (O.) helvola*, L.—Very rare at sugar; Killymoon.

Amathes (O.) lychnidis, Schiff.—Abundant at light and ivy blossom; ab. *ferrea*, Haw., the most common form.

Xanthia lutea, Strom.—Common at ragwort and honey-dew on sallows.

**Xanthia fulvago*, L.—Almost as abundant as the last; all of a pale yellow, not orange; var. *suffusa*, Tutt, not uncommon at Killymoon and near Tamnamore.

Orrhodia (Conistra) vaccinii, L.—Abundant at ivy bloom; less common at the sallows in the spring.

Orrhodia (C.) ligula, Esp.—Very scarce at Favour Royal (K.).

Eupsilia (Scopelosoma) satellitia, L.—Abundant at ivy and sugar.

Lithophane (Xylina) socia, Rott.—Locally abundant at sugar and ivy and at sallow bloom; var. *umbrosa*, Esp., not rare.

Xylocampa areola, Esp.—Common at sallows, also at Favour Royal (K.); several ab. *rosea*, Tutt.

Calocampa exoleta, L.—Common at ivy bloom and sugar, and also at Favour Royal (K.); several without dark suffusion on inner margin of fore wings.

Calocampa vetusta, Hb.—Generally abundant in the form ab. *brunnea*, Tutt.

Cucullia umbratica, L.—Generally common at flowers and at rest on palings.

Anarta myrtilli, L.—Common on moorlands and bogs; dark forms at Altadiawan (K.), also near Lough Fea.

**Hydrelia (Erastria) uncula*, Clerck.—Locally abundant near Tamnamore, Lough Neagh, flying freely in the afternoon sunshine.

Rivula sericealis, Scop.—Abundant in damp meadows.

Gonopterinae.

Scoliopteryx libatrix, L.—Common in the autumn and in the spring after hibernation, at sugar.

Quadrifinæ.

Plusia chrysitis, L.—Common and widely distributed, several examples of the type with the metallic colour divided by the median brown band.

**Plusia bractea*, Fb.—Sometimes not rare at flowers at Lissan and Tullylagan; an example found on *Lamium* by Prof. Harrison near Cookstown; flies in the afternoon sunshine as well as at dark.

Plusia festucæ, L.—Most abundant in this district at flowers; several with the metallic spots connected together, forming one central golden blotch; ab. *juncta*, one example, has the spots confluent on one fore wing and divided on the other.

**Plusia iota*, L.—Locally not uncommon, and var. *per-contationis*, Fr., occurs. Localities: Lissan, near Cookstown (H.), Lough Fea, near Stewartstown, and at Lough Neagh.

Plusia pulchrina, Haw.—Abundant, varying from a pale salmon colour to a deep purplish red, and often with a bright orange patch below the Y mark.

Plusia gamma, L.—Not very common, except occasionally in the Lough Neagh district, where it sometimes abounds at mint flowers.

Plusia interrogationis, L.—Kane found this species not rare at Altadiawan; often abundant over the heather near Lough Fea; at Killymoon it occurs on an isolated area of bogland which has been preserved from the general destruction by peat cutting; the species taken here are very dark, and without the beautiful purple tint of the moorland form.

**Abrostola triplasia*, L.—Locally abundant at Lissan, Lough Fea, and near Stewartstown; larvae on nettles near Cookstown (H.).

Abrostolla tripartata, Hufn.—Abundant and widely spread, although Kane found it rare at Favour Royal.

Euclidia mi, Clerck.—Local at Favour Royal (K.), and also near Tamnamore.

ERRATUM.

Vol. liii, p. 277, line 3, for *L. deplana* read *L. complana*.

(To be continued.)

COLLECTING IN 1918 AND 1919 IN GLOUCESTER-SHIRE, ETC.

By C. GRANVILLE CLUTTERBUCK, F.E.S.

In 1918, the last and most critical year of the war, my volunteer duties seriously curtailed my spare time. Easter was devoted to a musketry course, and, having obtained a First Class Instructor's Certificate, I was one of those selected to take a class which met two nights a week and carried on until the middle of June. Added to which the claims of an allotment still further interfered with field work, although it supplied me with a few interesting captures. The following were the most noteworthy species secured: *Depressaria capreolella*, March 21st on the wing in the sunshine, Forest of Dean; *Cheimophila (Dasystoma) salicella*, males flying freely round a willow tree on roadside in the morning of March 24th; *Polyploca ridens* emerged April 6th, larva beaten from oak June 16th, 1917; *Ornix farigora*, on the wing on Cotteswolds, May 5th; *Tortrix (Sciaphila) virgaureana*, emerged June 15th, larva found on our hills feeding on flowers of *Anemone pulsatilla*, May 9th; *Lithocletis oxyacanthæ*, on wing in garden, May 13th; *Coleophora alcyonipennella*, netted in a wood near Gloucester, May 16th; *Sesia formiciformis*, in numbers, settling on flowers of dewberry, black bryony and comfrey in an osier bed, June 2nd; *Acrolepia perlepidella*, beaten out of small-leaved lime (*Tilia cordifolia*) in Leigh Woods, June 6th; *Brenthis selene*, *Chrysophanus phœas* and *Sesia bombyliformis* (narrow bordered), at flowers of dewberry, Forest of Dean, June 12th; ♀ *Eriogaster (Bombyx) rubi*, detected by my wife amongst grass on our hills, June 13th; *Coleophora lineola*, amongst *Ballota nigra* near my allotment, June 20th; *Mompha propinquella*, on our hills, June 29th; *Epinotia (Trycheris) aurana*, on flowers of *Heracleum sphondylium* on a hilly roadside, July 4th; *Tinea albipunctella*, taken on a road near Gloucester, July 5th; and *Polygonia c-album*, var. *Hutchinsoni*, netted in my garden, July 9th.

In North Devon, between July 26th and August 13th, the following species were noted: *Nepticula trimaculella*; *Macroglossa stellatarum* (at flower of *Echium vulgare*); *Stenia punctalis*, *Triphœna interjecta* (on the wing in the afternoon); *Eucosma (Pædisca) profundana*, *Scoparia truncicolella* (beaten from alders on the bank of a stream); *Aristotelia (Apodia) bifractella* (on flowers of *Inula conyza*); *Pyrameis cardui*, *Epinephele jurtina* (bleached variety); *Eupæcilia atricapitana* and *Catoptria pupillana*. A large black fly, bearing a wonderful resemblance to a humble bee, was taken on August 12th and identified by Mr. Claude Morley as *Echinomyia grossa*, L. A brilliant, metallic, copper-coloured gall-fly, taken at the same time, was identified as Chalcid—*Torymus regius*, Nees.

On August 15th I was pleased to meet with *Cataplectica* (*Ecophora*) *fulviguttella* for the first time on the Cotswolds in company with *Laspeyresia* (*Semasia*) *janthinana* at flowers of *Angelica*. On the 29th I cycled to Ganarew and back, twenty-five miles each way, and was rewarded by a sight of part of Mr. A. B. Farn's wonderful collection of butterflies. Really, one has no idea of the range of variation in our native Lepidoptera until one is fortunate enough to get a view of a truly great collection like my friend's. On September 12th *Swammerdamia heroldella* began emerging from pupæ brought from Devon. On the 17th a ♀ *Lasiocampa* (*Bombyx*) *quercus* emerged from a pupa resulting from a larva found in Devon in August, 1917. On the 28th a fine fresh specimen of *Chrysophanus phleas* flew into my wife's market-basket in the middle of the City of Gloucester and was easily captured. A specimen of *Vespa crabro* visited my house on October 1st for the first time in fourteen years' residence. A ♂ *Asteropepus sphinx* (*cassinea*) and a ♂ *Hybernia defoliaria* was taken on a gas lamp, October 25th.

The year 1919 will always be memorable to me owing to the discovery near Gloucester of a locality for the rare plume *Pselaphophorus brachydactylus* (see 'Entomologist,' vol. lii, p. 274) and the capture of a new form of *Plusia pulchrina* (see 'Entomologist,' vol. liii, p. 1). I credit these captures first of all to the spirit of emulation fostered by a sight of Mr. Farn's glorious collection, and secondly to the visual training I had as a volunteer, for both species were detected at rest by sheer quickness of vision. A bad attack of 'flu in February took some of my energy, but a fine summer acted as a good tonic and I was able to add a few species to both the Gloucester and Devon County lists. The day spent on our hills in June with Mr. Rowland Brown (see 'Entomologist,' vol. lii, p. 174) will live in my memory as a "red letter day." It was delightful to have the company of one so well known in the entomological world and to listen to his collecting experiences in foreign climes, and above all to have the great pleasure of introducing him to the *Cotswold Arion*.

During an Easter visit to Swanage I captured a hibernated specimen of *Epermenia chaerophylella* in a garden (April 17th), whilst at Lulworth Cove flowers of Common Alexanders (*Smyrnium lustratum*) were picked, and on the return journey a ♂ *Xanthorhoe multistrigaria* was taken in the train near Chedworth Station on the Cotswolds. *Acompsia* (*Ecophora*) *tripuncta* was taken for the first time just outside a small wood near Gloucester, where several nightingales were singing during the evening of May 30th. Larvæ of *Saturnia pavonia* (*carpini*) in two stages of growth were found by one of my daughters feeding on meadow-sweet in our seed beds, June 13th. The next day on our hills a ♀ *M. stellatarum* was observed busily ovipositing on the flowers

of White Bedstraw in the afternoon. June 28th, near our osier beds at 9 p.m., I netted a fine specimen of that beautiful Tinea, *Aristotelia hermannella*, a species apparently new to our county list. July 12th a larva of *Calocampa exoleta* was feeding on seeds of dock on a hilly road-side, a fine ♂ being reared October 3rd. *Mompha conturbatella* was found amongst *Epilobium angustifolium* (July 24th), and *Sophronia semicostella* beaten from a hedge (July 26th) on our hills, both species so far as I know being new records for Gloucestershire.

During a seaside holiday in North Devon, from August 2nd to the 22nd, my most noteworthy captures were *Gelechia (Lit.) fraternella* on the 8th and a fine ♂ *Agriades corydon* at the back of the sandhills on the 15th. These species do not appear to have been recorded from Devon before.

I also found *Plebeius aegon* amongst heather on the downs, but, according to the 'Victoria County History,' it has only hitherto been recorded from South Devon.

In conclusion, my grateful thanks are due to Mr. E. Meyrick, F.R.S., for kindly naming most of the micros, and to Mr. Claude Morley, F.E.S., for identifying the flies.

23, Heathville Road,
Gloucester.

NOTES ON THE SEASON OF 1920 IN WEST SUSSEX.

By C. M. WOODFORD.

On March 8th, a fine sunny day, *Eugonia polychloros* was seen on a window in the house. This species has hibernated in the house on a former occasion. From March 19th to 23rd the weather was bright and warm, and *Gonepteryx rhamni*, *Aglaia urticæ*, *Eugonia polychloros* and *Vanessa io* were observed on each day. On March 23rd a single male *Euchloë cardamines* was seen, and on 28th *Pieris rapæ*. On March 31st my diary records the capture of four *Euchloë cardamines* ♂, and an *E. polychloros* ♀ was captured and liberated. From April 1st to 22nd the weather was dull and cold and the emergence of everything was retarded. On April 23rd the first female of *E. cardamines* was observed; just a month after the appearance of the first male. It was not until May 7th that *Pieris napi* was seen, and on May 11th *Pieris brassicæ*. On May 12th, the weather having set in fine and warm, *Nisoniades tages* was out in abundance, and one individual of *Chrysophanus phœas* was seen. On this date a single *Pyrameis atalanta* was observed settling on the roadway of a lane near a clump of nettles. The same individual, identified by a peculiarly damaged wing, haunted the same spot daily until June 16th, a period of over a month. On May 14th

Pararge megæra was observed, and on 15th *Hesperia malva*, *Nemeobius lucina*, *Callophrys rubi*, and *Brenthis euphrosyne* were taken, and *Pyrameis cardui* seen. *P. cardui* was again seen on 16th and 19th, and on June 2nd.

On May 22nd *Cœnonymphpa pamphilus* was seen and on 23rd *Polyommatus icarus*. On May 31st *Brenthis selene* was taken, but it was not fully out until a week later. *C. rubi* was still on the wing, but in poor condition on June 6th, and a belated female *E. cardamines* was seen on June 7th, and the last *Nemeobius lucina* on June 11th. A male *Epinephele jurtina*, freshly emerged, was taken in the grass on June 14th, and the last male *E. cardamines* was seen on the same date. On June 15th *Augiades sylvanus* was seen, and on 16th one was captured. By this time *E. jurtina* was fully out.

A note in the diary on this date refers to the ravages occasioned to the oak-trees for the third year in succession by the larvæ of *Tortrix viridana*. Rooks in flocks and other birds were now preying upon the pupæ rolled up in the oak-leaves. The first perfect insects were observed on June 13th, and by 16th they were flying in thousands. On June 18th *Argynniss cydippe* was observed, and one specimen in beautifully fresh condition was taken. Also *Aphantopus hyperanthus* freshly emerged. *B. euphrosyne*, very much worn, was still flying at this date. *P. atalanta* and *P. cardui* were seen, also *G. rhamni*, very late. On June 19th a single *C. rubi* in worn condition was taken, and liberated. On June 23rd two *P. cardui*, in poor condition, were seen on the Downs. On the same day *Limenitis sibylla* freshly emerged. Two days later it was out in quantity. *B. selene* was seen for the last time on June 28th. On June 30th *Dryas paphia* was seen and taken, also *Pararge egeria* (*egerides*), second brood.

July set in wet and cold and until 13th of the month nothing was seen. At that date *L. sibylla* was much worn, having evidently suffered from the weather. *A. urticae*, freshly emerged, was seen, also *Epinephele tithonus* ♂, and *Adopæa flava*. On July 17th *L. sibylla* was sought for in vain in its favourite haunts: a contrast to the previous year when it continued on the wing up to the first days of August. On July 20th *Argynnis aglaja* was seen for the first time, and *Agriades corydon*, freshly emerged. On July 29th *P. atalanta*, newly out, was observed, and from this date onwards to the end of the season has been particularly plentiful. *Celastrina argiolus* was sought for in vain at a particular holly hedge where in previous seasons it has been plentiful at this date. On the same day *P. megæra*, second brood, and *P. icarus*, second brood, were observed. The first female of *E. tithonus* was also observed, all seen and taken hitherto having been males. *Hipparchia semele* was fresh out at the same time. On August 3rd *A. corydon* was fully out on

the Downs in numbers. *P. cardui*, freshly emerged, and *Colias edusa* were seen for the first time. On August 5th *Aricia medon* second brood appeared. *G. rhamni* was noticed on 7th. On August 9th *A. cydippe*, in battered condition, was taken, and on August 13th *D. paphia* in fair condition still, with *P. egerides*, third brood, newly emerged. On August 16th between twenty and thirty *C. edusa* were seen and five taken. On August 27th *A. bellargus* was freshly out. September 1st *C. edusa* still fairly plentiful. September 9th *A. aglaia* seen and taken in fair condition although a very late date. September 14th *P. egerides*, fourth brood, taken. Another seen on September 23rd. October set in wet and windy, but the weather improved after the first week. *P. atalanta* was particularly abundant on the flowers of scabious. *C. edusa* could be seen at any time by visiting the locality it frequented, and from which it did not appear to stray.

C. pamphilus and *P. rapae* were seen for the last time on October 7th, and *E. jurtina* on October 14th. A belated *P. icarus* was taken on October 18th. On October 23rd a large dragon-fly, *Æschna cyanea* ♂, was taken. *P. atalanta* had not been seen since October 11th, and those seen were much worn and damaged, but on October 24th, a beautifully fine day after a foggy morning, two perfectly freshly emerged specimens, with all the bloom upon them, were taken upon the flowers of garden scabious. There can be no doubt as to their recent emergence, as one emitted a drop of the red fluid peculiar to freshly emerged specimens, in the box in which it was confined. On October 25th *P. atalanta* and *P. cardui* were seen and *C. edusa* taken, also a dragon-fly, *Sympetrum striolatum*. On 26th, 27th and 28th *A. urticae* was seen in the garden. On October 29th *C. edusa* was seen and a male *P. icarus*, in passable condition, taken. On October 30th *P. atalanta* was seen for the last time. On October 31st the weather changed to dull and cold and hopes of taking a November *edusa* were abandoned. Twenty specimens of *C. edusa* were taken in all—all males with one exception.

No striking aberrations were met with. Of thirty-two *C. phœbeas* taken, seven were referable to ab. *cœruleopunctata*. Of twelve *V. io*, three were ab. *cyanosticta*. One very dwarf *P. napi* was taken, measuring only 32 mm. across the wings. Of a long series of *E. cardamines* the largest female measured 46 mm., and the smallest male 33 mm.

Wednesday, November 17th, was a beautifully fine, sunny day, without wind after a hard frost. *P. atalanta* was seen flying in the sunshine at 11.30 and *G. rhamni* two hours later.

The Grinstead,
Partridge Green,
Sussex.

NOTES ON LEPIDOPTERA AT ALTON IN 1920.

By E. A. C. STOWELL.

THE vicissitudes of the weather produced some erratic appearances among the butterflies. February and March were very warm. *Vanessa io* appeared on February 10th by the roadside, but the most surprising dates were *Celastrina argiolus* on March 30th, and *Euchloë cardamines* March 31st. Then the season collapsed. The only further sight I had of *C. argiolus* was on May 15th and September 7th—an odd set of dates! The species was common last year, but I fear this was one of the fatal seasons that give it a set-back. In April I spent a week in the Isle of Wight, and found larvae of *Melitaea cinxia* swarming near Niton, but very hard to rear. About three dozen larvae brought home only yielded eight imagines. There were no parasites that I could observe, but both larvae and pupæ dried and shrivelled up. Yet their habitat on the undercliff is hot and dry enough.

The Vanessids promised well. On May 16th, during a Sunday afternoon stroll, I encountered *Aglais urticae*, *V. io*, *Pyrameis cardui* and *P. atlanta*, while something looking like *Eugonia polychloros* flew over a tall barn; I met also the three common species of *Pieris*, *Gonepteryx rhamni* and *E. cardamines*, a most unusually complete list for the date. *P. atlanta* was the butterfly of the year, often seen in June and abundant in September, while a fresh-looking specimen was brought me, caught before 9.0 a.m. on November 9th.

P. cardui was not common in the autumn, and I saw nothing of *A. urticae* till on October 7th a fresh-looking specimen appeared in the garden. Presumably the second brood was much belated. *V. io* was fairly common in the autumn; in my experience it has been commoner of late years than *A. urticae*.

The woodland butterflies were normal in date, but fewer in number than last year. I noted *Brenthis euphrosyne*, May 22nd, *Nemobius lucina*, May 23rd, *B. selene* (not fresh) and *Limenitis sibylla*, June 23rd. The larvae of the latter must have been abundant in spring, as I picked up three in a few minutes on April 24th in the Holt, though not out to look for them. They are remarkably accommodating larvae. I left them in the glass-topped metal box, fed them on the "netted" Japanese honeysuckle; they suspended from the glass and emerged the first week in June—fine specimens, though I had to raise the lid of the box to make room for their wings to expand. The pupa of this species is incredibly small to contain such a large butterfly.

I bred six *Zephyrus betulae* from as many larvae beaten on June 7th, but could only see one wild imago (August 30th). *Melanargia galathea* and *Argynnis aglaja* were out on July 4th. *Dryas puparia* was not out on June 30th, fairly plentiful at the end of July, and I captured a male for identification at Selborne on September 3rd.

A second brood appearance, unexpected in such a season, was made by a solitary *Nisoniades tages* on September 3rd.

Colias edusa was first seen on August 10th at Corfe Castle (where I also procured some *Adopea acteon* on a dullish day). Several odd specimens were seen about Bournemouth, but I think this species dislikes heaths, and does not alight on heather. I saw it also from the train near Winchester, on August 27th, and twice at Alton in September. *Agriades corydon* was out on August 10th at Corfe, and quite fresh males on September 3rd in its very limited habitat at Alton. *Pararge egeria* I only saw once (Oakhanger, September 11th). *P. megæra* was about as usual—not common here.

On a sunny afternoon in October I observed with interest the different hibernating practices of two species. *A. urticae* was flying frantically round and over the house, evidently searching for a suitable cranny as a refuge. *G. rhamni* fluttered up from a flower, settled on an ivy-leaf without the least investigation, and stayed there for the night. I noticed the same want of pre-meditation in this species in the autumn of 1915, when it flew to a leaf and stayed there for weeks. There is no attempt to get well inside, or out of sight, and little reconnoitring or selection. On the other hand, I watched *P. atlanta* retire for the night into a holly bush, with a considerable amount of fuss, and it finally got well inside. It has been noted that Vanessids seem to be gregarious in hibernation. I doubt if this is intentional, but they reconnoitre the neighbourhood very thoroughly, and the same cranny or window eventually strikes the insect mind as suitable, for some reason not clear to us. During the two summers I have been here I have noted forty species of *Rhopalocera* within a radius of six miles. I think this is a pretty good record.

(To be continued.)

NOTES AND OBSERVATIONS.

SATYRUS HERMIONE IN MACEDONIA, AND SOME OTHER BALKAN BUTTERFLIES.—In my “Supplementary Note on the Butterflies of South Macedonia,” published in the May number of the ‘Entomologist’ (vol. liii, pp. 106–109), I noted the absence of *Satyrus hermione* from the reports of the several collections reviewed and discussed. I have again been through the various captures kindly given me by Capt. P. J. Barraud, and find I have two very fine pairs of this butterfly labelled “Saracli, June 26th, 1917.” Soon after the paper appeared I received a very interesting communication from Major P. P. Graves, then at Constantinople, commenting on some of the species enumerated, and criticising the records cited for the Central Balkan and Bulgaria. He first drew my attention to my identification of *Chrysophanus thetis* in the Natural History Museum Collection, and I do not think, in view of his remarks, that it would be safe to retain this beautiful Copper in the list on the strength of a single (and perhaps inaccurately identified) specimen. “It had

seemed to me," he wrote, " confined to pine and cedar-wooded areas" of the Veluchi (Greece), and certain parts of Northern Asia Minor and the Lebanon. With regard to *Cænonymphia dorus* (so common in S.E. France) in the Central Balkan reported by Bachmetjew, and also *Agriades escheri*, neither is quoted with authority by Rebel ('Cat. Lep. d. Balkanlander'). At all events *escheri* is included as a doubtful, and from information recently to hand from Dr. Verity it would appear as though the distribution of this "Blue" is not extended south of the Central Alps, east of Botzen. Major Graves also points out that Batchmetjew's *Epinephele ida* is not supported by Rebel, though I find it reported from Valona in Southern Albania (or is it in New Greece now?), and of course, it occurs abundantly in Corfu, and at Zara and Spalato on the Eastern Adriatic coasts. The omission of *Hipparchia briseis* from Capt. Barraud's "Notes on Lepidoptera, etc." ('Entomologist,' vol. li, p. 88, 1918) is accidental. I have an example of exceptional size, obviously referable to var. *major*, Oberthür, taken by him at Paprat in June, 1918, and it is stated by Mr. Mace ('Entomologist,' vol. liii, p. 103, 1919) to have been seen in June and again in autumn, though not unduly common. This last record, I assume, denotes an extended emergence rather than the occurrence of a late autumnal second brood, for I know of no *Satyrus* or *Hipparchia* north of the Mediterranean or at all which is double-brooded. That the flight of the Satyrids of these groups may be prolonged well into the autumn I have proof, for I find from my diary that *Satyrus circe*, which first appeared in the Alpes-Maritimes in mid-June, was still on the wing at Beaulieu, A.M., when I was there in 1902 on October 9th.—H. ROWLAND-BROWN; Harrow Weald, March 11th, 1921.

BUTTERFLIES OF NOTE OBSERVED AROUND TRING.—Having given my time entirely to butterflies around Tring for the last four years, a few notes on the rarer ones may be interesting. *Pieris rapae*: I took a very curious ♀ flying along a road in June, 1920. All wings of a deep creamy tint without any of the usual spots, also a very deep yellow ♀ bred from Tring larvae. *Leptosia sinapis*: Of this local species I had the good fortune to capture a ♂ in a wood near by in 1919. Not seen since. *Colias edusa*: Odd examples to be found nearly every year. Five specimens last August. *Gonepteryx rhamni*: A crippled ♀ bred from ova, 1920, has the underside streaked with brownish-red. Another specimen presented to me has the fore wing tipped with red. Taken at High Wycombe. *Brenthis euphrosyne*: Several males last year with the usual silvery spots replaced by dull leaden-blue. Also a ♀ approaching creamy. *Argynnis aglaja*: I took a pure white example in July, 1917, near Halton, Bucks. Seen several days before I netted it, when half its hind wing was missing. *Dryas pupha*: A few last year in the woods. Very scarce round here, although I took a fair number of ♂♂ in 1919 but left the ♀♀. *Melitaea artemis*: Very much to my surprise I took nine specimens last year, never having seen it before, some just in Bucks and others well in Herts, these being much larger and brighter. *Euvanessa antropo*: This specimen was recorded by my father. Taken in an old boot by my friend, who gave it to me in 1917 ('Entomologist,'

* 'Ann. Nat. Hist. Hof Mus., Wien,' xxvii, pp. 281-334, 1913.

October, 1917, p. 235). *Aglais urticae*: Two very pale examples, one almost white, both of which I took in the same field in 1918 and 1919. *Melanargia galatea*: One specimen, difficult to describe, with the black patches distributed very irregularly. I took it last year on Bucks Chilterns. *Epinephele jurtina (junira)*: Several bleached ♀♀ last year; ♂♂ partially so. *Pararge megera* and *P. egerides*: Both these are now well represented, but prior to 1918 I had not found them. *Cœnonymphpa pamphilus*: My best aberration may be included here. I took it on the hills near Aldbury in June, 1918. All wings of a dull mahogany-brown; gives the appearance of the next species.* The underside is a very rich deep brown. Last year several bleached examples, and a curious one having three wings normal and one pure white. *Chrysophanus phœas*: Two specimens with all wings pale metallic yellow, in same field, curiously enough, where I took the pale *urticae*. *Aricia medon*: An obsolete underside last year on Bucks Chilterns. *Agriades corydon*: Several *semi-syngrapha* near Halton and Aldbury last August. Two somewhat striated undersides and a *semi-obsolete* in 1919 and a grey ♂. *Cupido minimus*: Out of hundreds examined, one obsolete underside, Bucks Chilterns, 1920. *Nisoniades tages*: A very remarkable aberration last year at Dancer's End. All wings of a pale straw, one side being almost white. I would like to know if any of your readers have seen other brown specimens of *pamphilus* as I find no mention of it in my books.—A. L. GOODSON; Park Road, Tring, Herts.

ZEPHYRUS QUERCUS AB. OBSOLETA.—As varieties of *Zephyrus quercus* seem to be very rare, it will perhaps be of interest to mention that I took a ♀ of this insect at Arnside, Westmorland, on August 18th, 1920, in which the usual blue patch is almost completely absent, being represented only by a few scattered blue scales, almost invisible at a casual glance. It seems to be referable to ab. *obsolete*, Tutt, of which the latter only records one specimen, bred by Mr. Raynor at Hazelleigh.—G. H. E. HOPKINS; Shevington Vicarage, near Wigan.

PIERIS RAPÆ, AB.—During July and early August of last year I took a fairly long series of *Pieris rapæ* at Finchley, and on examination after they were set I discovered among the females a form having a blackish-grey spot in the discal area of the hind wings. I found four examples of this aberration in the series of forty-two females I had set—roughly 10 per cent. Two of the four have the spot well-developed and distinct; the other two have it indicated by a cluster of black scales. This spot is situated between veins 3 and 4, and is placed about one-third the distance up from the margin to the base of the wing. I notice the specimens bearing this spot have the other black markings somewhat heavier than normal summer females. I exhibited these specimens at the South London Entomological and Natural History Society on October 14th last, and since then two of the members have told me they have looked through their series and found they had examples similar to mine. As far as I am able to trace this form does not appear to have been described or named, and as it seems to be an aberration that is not uncommon I suggest it should be called *nigropunctata*. Since writing the above I find Mr. Frohawk gives a very excellent figure of this form in his 'Natural

* Dark form of *C. tiphon (davus)*.

History of the British Butterflies'; the figure is to be found at the top of the left-hand column of p. 93 of 'The Field' dated January 16th, 1915.—B. S. WILLIAMS; 77, Durham Road, East Finchley.

RUMICIA PHLEAS AB. CUPREOPUNCTATA, TUTT.—I took a splendid example of this uncommon form of *phleas* at Finchley during August of last year. The copper spots on the hind wings (which occupy the same positions as the blue spots in the well-known form *cæruleopunctata*) being bright and metallic, although not quite so brilliant as the hue of the fore wings; the bases of the hind wings also have a most marked copper sheen or gloss spread over them. At the same time I took a freshly emerged example of ab. *subradiata*. Tutt.—B. S. WILLIAMS; 77, Durham Road, East Finchley.

EARLY APPEARANCE OF PIERIS RAPAE.—On February 16th a freshly emerged male of *Pieris rapae*, L., was taken on the wing at Letchworth, Herts. This is a remarkably early date, and it may be noted that the average date for twenty-five years as given in the Royal Meteorological Society's Phenological Report for 1920 is April 20th. The above-mentioned specimen was exhibited at a meeting of the Letchworth and District Naturalists' Society held at Letchworth Museum on March 15th, 1921.—RAY PALMER, F.E.S.; Ingleholme, Norton Way, Letchworth.

EARLY APPEARANCE OF DREPANA LACERTINARIA.—On March 26th, whilst "kicking" the trunks of trees for *Coccyx jimbriana* on Chislehurst Common, a male *D. lacertinaria* was dislodged from a birch tree. No doubt the exceptionally hot sun on the previous day (Good Friday) had caused the early emergence of this species.—LEONARD T. FORD; St. Michael's, Bexley.

DIANTHOECIA ALBIMACULA, BORKH., IN SUFFOLK.—Some time ago I received, through the kind medium of Mr. J. Ray Hardy, a fine female example of this beautiful and very local species, quite typical in marking, colour, and general appearance, which had been captured close to Stowmarket. Hitherto, so far as the British Isles are concerned, it has occurred (*a*) in Kent, where in 1816 the original specimen was found at Birch Wood, and subsequently at Folkestone and Dover. There, so far as my own experience lies, its larva seems to feed exclusively upon the seed-capsules of *Silene nutans*, L., and its variety *paradora*, Sm., locally known as the "Dover" Catchfly. In South Hants it has (*b*) been noted, but only once, near Gosport, and (*c*) in South Devon at Seaton and, more recently, Axminster district. This single instance, therefore, so far north of these known localities, and in an inland station, is of particular interest, and it is to be hoped that now attention has been drawn to its occurrence in the east of England more examples may be found, so that the species may be recognised more fully as a true native there. Upon referring to the 'Flora of Suffolk,' compiled by my late friend the Rev. Dr. W. Marsden Hind, formerly incumbent of Pinner, Middlesex, and subsequently Rector of Honington, near Eye, I find that *Silene nutans* has only once been recorded as a casual, at Ipswich, but this county possesses a smaller Catchfly (*S. otites*, Sm.) hardly found outside it in the British Isles, peculiar to the "Breck" sand district between Tuddenham, Brandon and Mildenhall, which overlies the chalk, and *albinotula* might possibly occur there. This district is some

twenty-four miles west of Stowmarket, that town, however, being situate also on calcareous soil. The common Bladder Campion (*Silene inflata*, Sm., vel. *Cucubalus*, Auct.) seems as abundant as elsewhere in Suffolk, and this may have become the food-plant of the larvæ, through lack of more congenial pabulum.—J. COSMO MELVILL; Meole-Brace Hall, Shrewsbury, April 10th, 1921.

POINTING ENTOMOLOGICAL PINS.—With regard to the difficulty of pointing pin wire, mentioned by Mr. W. G. Sheldon ('Entomologist,' April, 1921, p. 99), I had occasion some years ago to sharpen some "cabinet points" for labelling purposes. The "points" as sold were absolutely useless, bending at right angles if one tried to pierce the label. I found the simplest way to put on proper points was to use the little fine-grain emery wheel supplied with some sewing machines for re-pointing broken needles. The stitching mechanism is first disconnected, and then the emery-wheel device can be run off the driving wheel by means of a rubber-rimmed pulley. I found difficulty in holding the wires, and managed best with a short length of very fine tubing let into a handle. With a long length of wire this could be passed right through the tube and the pins cut off as sharpened, the tubing acting as a tool holder. Probably a small drier holder or fly-tying vice would answer, or even a couple of stout matches slightly grooved and bound with thread, the wire being first placed between the matches, and drawn out so that about $\frac{1}{4}$ in. projects at each sharpening. The difficulty is to hold the wire firmly whilst sharpening is in progress, and also to rotate it evenly.—G. BERTRAM KERSHAW, M.Inst.C.E.; 9, Victoria Street, S.W. 1.

CNEPHASIA COMMUNANS, H. S., IN SURREY.—In the year 1890 I took a single example of this species near here, but although I have repeatedly hunted for it since, success has not been mine until last year. I am aware, of course, that, as reported in 'E.M.M.' xli, p. 260, Mr. Thurnall captured a number of specimens in the Croydon district in 1904. On May 24th last, however, I found the species common in the Dorking district some twenty miles away from here.—W. G. SHELDON, Youlgreave, S. Croydon.

HEMEROBius STIGMA, STEPH. (NEUROPTERA), IN JANUARY.—It may interest those who collect in the winter to hear that this little "Lace-wing" was taken flying at Esher Common, Surrey, on January 13th and 24th, 1921, while a fair number fell into the beating-tray from the small scotch firs on January 30th.—W. J. LUCAS.

THE COMMON CRICKET SWARMING IN A REFUSE DUMP.—Mr. W. J. Lucas, in his interesting "Notes on British Orthoptera, 1920" ('Entomologist,' April, 1921, pp. 94–97), remarks with reference to *Gryllus domesticus*, Linn.: "In dwelling-houses this cricket seems undoubtedly to be getting less common; in fact it is necessary to revise our estimate of its frequency." Possibly persistence in the disposal of household refuse by the primitive method of "dumping" may to some extent account for this phenomenon. At any rate a large refuse dump several acres in extent, close to the Great Northern Railway and not far from Hatfield, was found on April 12th, 1921, by Lieut.-Col. S. Monckton Copeman, F.R.S., and the writer, to be teeming with *G. domesticus*. Wherever the surface of the refuse was

disturbed a number of the insects in various stages, from quite young nymphs to adults, was almost invariably dislodged, while on merely walking over the dump the chirping of the males could be heard. The dump in question, which is the product of the dust-hins of a large London borough, is said originally to have been started thirty years ago. In view of the apparent partiality of the house-cricket for kitchen refuse, it is therefore not difficult to understand either the involuntary deportation to the country of large numbers of London crickets during this period, or the present size of the colony. It may be added that, in his 'Monograph of the British Orthoptera' (London: Ray Society, 1920), Mr. Lucas mentions three instances (one in England, two in Scotland) of the occurrence of *G. domesticus* in some numbers in or near refuse dumps.—E. E. AUSTEN; British Museum (Natural History), London, S.W. 7.

RECENT LITERATURE.

Annals of Tropical Medicine and Parasitology, vol. xiv, No. 2, November 27th, 1920, and vol. xiv, No. 3, February 8th, 1921.

A few papers touch on Entomology: they are:

(1) "Fish and Mosquito Larvae in Bengal, Bihar and Orissa, India," by T. Southwell; pp. 181-186, 1920.

(2, 3) "Observations on the Ceratopogonine Midges of the Gold Coast with Descriptions of New Species," Parts i and ii; by H. F. Carter, A. Ingram and J. W. S. Macfie; pp. 187-274, with a number of text-figures and 5 plates, 1920.

(4) "Further Experiments with *Anopheles plumbeus*, Stephens; its Infection with *P. falciparum* in England; also Notes on the Apparatus and Technique Employed," by B. Blacklock and H. F. Carter; pp. 275-282, with 1 plate, 1920.

(5) "Observations on the Ceratopogonine Midges of the Gold Coast with Descriptions of New Species," Part iii, by H. F. Carter, A. Ingram, and J. W. S. Macfie; pp. 309-331, with a number of text-figures, 1921.

(6) "*Musca inferior*, Stein, Type of a New Genus of Philaeomyine Flies (Diptera)," by Prof. M. Bezzi; pp. 333-340, 1921.

W. J. L.

OBITUARY.

With very great regret we have to record the death, on February 2nd, of Dr. Tsunekata Miyake, F.E.S., aged 42 years.

He was born on May 21st, 1880, at Kanazawa, Ishikawa Prefecture, Japan. From early youth he took a special interest in entomology. At the age of seven years he moved to Tokyo, where he collected and studied insects more eagerly and got up several entomological books.

After he had graduated at the Science College of the Tokyo Imperial University he wrote upon Lepidoptera and Neuroptera and described several new species, but he was widely and better known as an authority on Mecoptera of Japan.

In 1917 he took his Doctor of Science by presenting a thesis, viz. "Studies on the Mecoptera of Japan."

At the time of his lamented decease he was studying on the Japanese Trypaneidae. N. M.





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OXIGRAPHIA LITERANA, L.: ITS LIFE-CYCLE, DISTRIBUTION, AND VARIATION.

By W. G. SHELDON, F.Z.S., F.E.S.

It is a remarkable fact that although this species is one of the best known, and certainly the most beautiful of our British Tortrices, if indeed it is not the most beautiful Lepidopteron now to be found in the British Isles, its life-history is practically unknown; for though various Lepidopterists have bred odd specimens, so far as I am aware the larva has never been identified, and its habits and date of pairing and the egg stage are quite unknown.

This is all the more singular because the larva is, for a Tortrix, very distinct, and one which is easily recognisable—how easily the following incident will show:

Early last June, being at Brockenhurst, I called upon Mr. George Gulliver, and showed him a few larvæ I had reared from ova, and two or three which I had the same day beaten from oak in a wood near Brockenhurst. Mr. Gulliver, although he must have taken many hundreds of the imago, had never bred the species, or recognised its larva, but a few days afterwards he beat some larvæ which he recognised as those of *O. literana*, and later on in the summer actually bred out a number of specimens.

So far as I am aware the specimens that have been casually bred have always come out of oak. Barrett says ('Lep. Brit. Isles,' x, p. 217), "There can be little doubt that it (the larva) feeds on oak." The latest writer on the species, Kennel ('Pal. Tort.,' p. 83), says: "The larva lives from May to August on oak (*Quercus robur* and *pedunculata*) between spun leaves; it occurs certainly also on maple and birch, probably in two generations, the first in May and the beginning of June, the moth in July and August, the second in July and August, and the moths from September on through the whole autumn and winter." This suggestion that it may have two broods is certainly not correct so far as Britain is concerned, though it may be in the warmer regions it inhabits.

Amongst others who have bred it is Mr. South, who in 'Entomologist,' xv, p. 58, reports "a number bred from larvæ beaten out of oaks" (in North Devon).

There are several references to its feeding upon birch which are probably correct, for, as will be seen, it will feed upon the

leaves of this and several other trees ; but the suggestion which has been made that it feeds upon lichens, probably through the cryptic resemblance of the imago to these plants, I cannot find any support for.

It has not proved an easy task to work out the life-history, because I have found it difficult to hibernate the moths, and when I have succeeded in doing so it has been difficult to obtain ova from them in the spring. In the past five years I tried fruitlessly until last year. I did manage to get two females through the winter of 1917, from which there resulted a very few ova, but these proved infertile.

In the autumn of 1919 about two dozen imagines of both sexes were put in a large glass and perforated zinc cage, in which were placed leafy branches of oak. On the 28th of the following March, the season being very forward, I thought it advisable to inspect the contents of the cage and found there were twenty-one moths still living. I then introduced some freshly-cut branches of oak into the cage and stood it in a sheltered and shady position. On April 8th most of the moths were dead, but two of them were living and seemed fairly strong and healthy. On taking the branches out of the cage and examining them I found they were sprinkled over with about four dozens of the ova : these were deposited on the twigs, mostly singly, and on roughened places on the bark ; in some cases, however, two or three ova were placed adjoining each other and partly overlapping. They were very difficult to see : the parent moth is very apt to search out small depressions in the bark and to deposit an ovum in one of them ; in such situations the upper part of the ovum was usually level with the top of the depression. In one case an oak twig contained a number of shallow oval-shaped depressions ; some of these were taken advantage of by the moth, which deposited an ovum therein, almost entirely filling the depression, and the ovum was consequently nearly invisible.

THE OVUM.

The outline of the ovum is oval, with a length of about .83 mm. and a breadth of about .33 mm. The height is about .18 mm. It has, like all the Tortrices with which I am acquainted, its polar axis horizontal ; the surface is divided by very fine raised margins into a number of irregularly shaped cells. It is highly glabrous and opalescent when first deposited ; the envelope is not transparent ; as viewed by the naked eye the ovum appears to be pearly grey in colour. On April 11th the majority of the ova became leaden tinted, with an orange-coloured nucleus. The first ovum was noticed whilst the oak branches were in the cage on April 3rd. An ovum deposited on April 13th and kept under daily observation had changed to leaden colour five days after. It must be borne in mind that the season in April, 1920,

was at least three weeks in advance of the average. On the 11th of the month the oaks were breaking into leaf. The few ova I obtained in 1917 were not deposited until April 27th—a date I should consider about normal in an average season.

THE LARVA.

The first larva appeared on April 26th; this was from one of the earlier deposited ova, and therefore it would appear that this stage has a period of about three weeks.

A larva which emerged on May 2nd was kept under observation in all its stages, and the following notes were taken of it:

The length at first is about 1·4 mm. The head is intensely black and very glabrous; the rear portion consists of two prominent lobes, which have rounded bases. The head itself is somewhat acutely pointed in front; it is furnished on each side of the mouth with a prominent excrescence, which, owing to the smallness and activity of the larva, it is difficult to determine the structure of, but they appear to be tubercles emitting spines, and they are certainly retractile.* The prothorax is greenish white and very glabrous. The segments at the rear of the prothorax are greenish white and very spiny; the prolegs are large; they are greenish white in colour. The head is very large in proportion to the size of the body.

This larva was put in a small tin box with two oak leaves, one placed over the other; it mined in the first instar between the upper and lower cuticles of the upper leaf, entering from the lower side.

On May 14th the larva was in the second instar; it was now about 2 mm. long. The head and prothorax are intensely black and glabrous; the division between the two is wide and greenish-white in colour; the segments behind the prothorax are greenish-white and very transparent, the alimentary canal showing very distinctly. The prolegs are greenish-white, tipped and shaded with black; the larva is very spiny, the spiracles are not conspicuous. The retractile organs on each side of the mouth are not so prominent as in the last instar, but they are still distinctly visible. The larva in this instar does not mine the leaf, but feeds upon the lower cuticle, spinning a web alongside the midrib and dwelling therein.

On May 23rd the larva was in the third instar. It was now 5·75 mm. long, light greyish-green in colour, very transparent, with the contents of the alimentary canal very distinct; head and prothorax intensely black and glabrous, the division between the two similar to the preceding instar. There is no trace of an anal plate. The larva is very spiny; the prolegs and feet

* Since writing the above I am informed by Dr. Chapman that these protuberances are probably the antennæ. This question requires further elucidation when the material is available.

are intensely black and glabrous; the retractile organs on each side of the mouth are still visible. The larva in this instar spun the lower leaf to the bottom of the tin in which it was kept, and fed upon the lower cuticle.

On May 31st the larva entered the fourth and last instar; it was then 9 mm. long. The head is dark brown, mottled with black; it is very glabrous: the segments behind the prothorax are light greyish-green, the intestinal canal showing plainly as a dark line; the prothorax is of the same green tint, but it is more glabrous. On each side of this segment in the sub-dorsal area is a prominent dark brown blotch; these are placed about 1 mm. apart. The thoracic legs and feet are black and shining; the spiracles and tubercles are very inconspicuous. In all the instars the larva is very spiny; it tapers a good deal towards the anal extremity, and is exceedingly active, wriggling violently when disturbed. In this stage it spins together two leaves of its food-plant and skeletonises them in a similar manner to *Rhodopaea consociella*, but does not make any web like that species.

On June 10th the larva was full grown and ceased feeding; it was 18 mm. long; there was no perceptible difference since it was last described, except that of course the head was much smaller in proportion to the size of the other segments.

The larva in confinement would eat birch, lime, apple, beech, and of course oak, but refused plum, elm, hazel and hornbeam. Being mindful of its supposed pabulum of lichens I offered it several species, which it refused to touch, but immediately an oak-leaf was put in the cage it began ravenously to devour it: this experiment would seem to dispose of the supposed liking for lichens.

On June 14th the larva spun up for pupation between two oak leaves.

THE PUPA.

The pupa, one week after the change, was light reddish-brown in colour, darker at the junction of the segments. The wing-eases were lighter: the surface is only slightly glabrous. The abdominal segments are reticulated on the surface. The head has a distinct proboscis or cocoon opener, which, however, is blunt at its extremity. The wing-eases extend to the rear of the fifth abdominal segment. Each abdominal segment has the usual row of spikelets. The pupa has very few spines; it terminates in the usual anal hook, which points ventrally; it tapers gradually from the sixth abdominal segment to the anal extremity, which is blunt and square. The pupa is 8·50 mm. long.

The imagines, eight in number, emerged during the last week in July.

The larva is easily distinguished during the last instar from

any other that is feeding upon oak at the same period by the prothoracic markings, the greyish-green colour, and the gradual tapering to the anal extremity. In an average season it is probably full grown towards the end of June after the great crowd of larvæ, such as *Tortrix rirdana*, *T. xylosteana*, etc., have pupated; there are very few larvæ feeding then.

I did not find it common in the New Forest in a locality where the imago is usually frequent, but I got four larvæ as the result of about two hours' beating.

O. literana has been found abroad in Central Europe, Italy, Sardinia, Scandinavia, Russia, Northern Asia and Asia Minor; probably it occurs over practically the whole of the Palæarctic area.

In Britain its chief habitat is in the New Forest, where in some seasons it is locally common; in one or two woods there, known to me, it is to be obtained every year in some numbers. According to Barrett it is also found in many other woods in the south of England and in Wales; it appears, however, to be non-existent in some of the midland counties, is rare in the north of England, it is found in Scotland occasionally in the Edinburgh district, Perthshire, Roxburghshire, and the Clyde Valley, but in Ireland is confined to the counties of Cork and Kerry.

I have usually obtained it by beating low overhanging branches of oak trees in the morning; it then usually flutters down slowly to the ground and one can intercept it with the net. In the afternoon, however, it is more lively and generally darts at once to the ground, where its colour makes it hard to see, or it flies swiftly away, in either case escaping capture in too many instances. Of course if the weather is cold it is better to wait until the afternoon makes it a little lively. It is fully out by the middle of August, and the best time to obtain it is from then until the end of September, after which it often goes into hibernation; the hibernated moths are rarely seen in the spring.

Barrett says: "The moth sits by day on the trunks of trees; in the summer and autumn it loves to squeeze itself closely to the surface of an oak or apple-trunk among the lichens, when it is so closely concealed by its resemblance to them that it can only be discovered by blowing strongly with the breath upon the trunk." I have vigorously thrashed hundreds of oak trunks when working for this species, but have never been conscious that I have put up a specimen from one (though I have seen it occasionally rest upon them after being disturbed). So far as my experience goes the usual resort of the species is the overhanging branches, and if one is put up it will almost invariably settle again on a branch. Bearing in mind that even in the New Forest a dozen specimens in a morning is a more than average bag, it must take a power of breath to shift a series from the trunks by blowing!

VARIATION AND VARIETAL FORMS.

O. literana has an extensive range of variation : so extensive, in fact, and so distinct and widely apart are certain of the forms that the earlier authors considered there were several species involved.

A number of the forms have been figured, in some cases exceedingly well: unquestionably the best group of figures is Hubner's 'Tortrices,' figs. 88 to 97. The various forms keep very distinct, and there is little tendency for intermediates to occur, although these turn up from time to time.

O. literana, L. (Plate I, figs. 1 and 2.)

Synonymy.—*Literana*, L., Syst. Nat., edn. x, p. 530, No. 204 (1758); Edn. xii, p. 876 (1767); Schiff, S. V., p. 317 (1775); Fab., Sys. Ent., p. 646 (1775); Fab., Syst. Ent., tome iii, part ii, p. 271, No. 122 (1794); Hüb., Tort., fig. 89 (1797); Donovan, Brit. Ins., x, pl. 355, fig. 2, and p. 78 (1801); Haworth, Lep. Brit., p. 411, No. 53 (1803); Hüb., Verz., p. 386, No. 3747 (1826); Fröl., Tort. Wurt., p. 18 (1828); Stephens, Cat., p. 187, No. 7094 (1829); Curtis, List, p. 173 (1829); Treitsche, Schmett v. Eur., viii, p. 184 (1830); Rennie, Conspectus, p. 179 (1832); Curtis, Brit. Ent., p. 440, No. 1 (1833); Stephens, Haust., iv, p. 164 (1834); Godart et Duponchel, Hist. Nat., ix, p. 126, and pl. 242, figs. 1a and 1b (1834); Wood, Ind. Ent., fig. 1098 (1839); Westwood, Brit. Moths, pl. 96, fig. 10, and p. 164 (1845); Herr. Schäff., Schmett. v. Eur., iv, p. 152 (1849); Wilkinson, Brit. Tort., p. 160 (1859); Stainton, Man., ii, p. 230 (1859); Staudinger, Cat. Lep. Eur., p. 94 (1861), and p. 233 (1871); Frey, Lep. Schweiz., p. 284 (1880); Snellen, Vlinders, p. 176 (1882); Sorhagen, Klein. Schmett. Brail., p. 65 (1886); Meyrick, Brit. Lep., p. 522 (1895); Staudinger, Cat. Pal. Lep., ii, p. 81, No. 1458 (1901); Barrett, Brit. Lep., x, p. 216, and pl. 455, fig. 3 (1905); Spuler, Schmett. Eur., taf. 83, fig. 11, and p. 242 (1908); Kimmel, Pal. Tort., taf. 5, fig. 1, and p. 82 (1908); Wagner, Lep. Cat., par. x, p. 68 (1912).

Original description.—*Phalaena tortrix literana* alis rhombis superioribus viridibus characteribus atris. Habitat in Germania. Simillima praecedenti (*viridana*) sed alis saturatis viridibus. Characteribus plurimis atris (Linnæus, 'Syst. Nat.', ed. x, p. 530, No. 204 (1758)).

The type form occurs generally wherever the species is found in Britain; * although not the most abundant, it is one of the

* There is considerable variation in British examples of the type form; the majority have the black linear characters heavily marked as in Fig. 1. Others have these characters very slightly indicated as in Fig. 2, and there are all degrees of intermediates between those two. The description of Linné applies equally to all those forms, and unfortunately we are without evidence as to what his specimen was like other than his very brief description. It is not in his collection at Burlington House, and Clerck does not figure it. It is not improbable that he never saw the type, but that he described it from a German or other correspondent's description.

commonest forms. I should consider that in the New Forest it represents 20 to 25 per cent. of the specimens captured.

EXPLANATION OF PLATE I.

FIGS.

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|--|---------------------------------------|
| 1. <i>Literana</i> , L., strongly marked form. | 6. ab. <i>nigro-maculana</i> , n. ab. |
| 2. " " lightly " " | 7. ab. <i>mixtana</i> , n. ab. |
| 3. ab. <i>romanana</i> , Fab. | 8. ab. <i>irrorana</i> , Hüb. |
| 4. ab. <i>fulvoliterana</i> , n. ab. | 9. ab. <i>squamulana</i> , Hüb. |
| 5. ab. <i>tricolorana</i> , Haw. | 10. ab. <i>suffusana</i> , n. ab. |

(To be continued.)

COLIAS EDUSA, FAB. (CROCEUS, FOURC.): ITS SEASONAL FORMS, VARIETIES AND ABERRATIONS.

By H. ROWLAND-BROWN, M.A., F.E.S.

IN common with so many of our native or immigrant species, *Colias edusa*, the Clouded Yellow, is entangled in the distracting meshes of multiple nomenclature. I do not propose to discuss the merits of "*Edusa*," except to remark that Fourcroy's (Geoffroy's) 'Entomologia Parisiensis,' where the butterfly appears as *Croceus*, was published in 1785, whereas the volume (tom. ii) of Fabricius' 'Mantissa Insectorum' is dated 1787. Whether the insect described by Linnaeus ('Syst. Nat.', ed. x, 1, p. 469, 1758) is or is not our *Edusa*—he calls it *Hyale*—is a moot point, but both Esper and Kirby* were satisfied, and labelled the species accordingly, and, as a reviewer of the famous 'Catalog' of 1901 points out,† Staudinger deliberately violated the law of priority when he maintained *Edusa*.

In my "Working List" ('Entomologist,' li, p. 1) and for the purposes of this paper, and in view of the nomenclature still followed by British lepidopterists, and pending an authoritative decision by the International Committee on Nomenclature, I reluctantly retain the time-honoured "*Edusa*," though the majority of continental lepidopterists have now reverted to the older "*Croceus*," and I find that M. Oberthür, too, adopts *Croceus* in his account of the species in Algeria ('Lépid. Comparée,' fasc. x, p. 75).

My present object is to set forth its seasonal forms, named varieties and aberrations, especially as many of our collectors, judging from their contributions to this magazine, are not altogether familiar with the published descriptions even of such as occur periodically in the United Kingdom.

SEASONAL FORMS.

All evidence available goes to prove that *Colias edusa* lives and often flies continuously throughout the year in the warmer

* 'Cat. Diurn. Lepid.,' Supplement, p. 799, No. 2, 1877.

† 'Entomologist's Record,' vol. xiii, p. 323, 1901.

regions of the Mediterranean littoral. From the eastern area (Palestine) I have female examples, kindly sent me by Capt. Barraud, late R.A.M.C., taken at Beisan, 400 ft. below sea-level, on January 31st, 1920, already worn. They are small ($= ab. vel forma minor$, Failla), dusky, and the orange-yellow ground-colour lacking in lustre. They are the parents of the next emergence, which apparently takes place at or towards the end of March. Fresh female examples on the 31st, north of Jerusalem, 800 ft. below sea-level; and again fresh females at Haifa, on the coast, May 21st, 1920—these last two rather larger, but still small compared with the *gen. test.* (= first emergence in England) form of August. From that date onwards there would seem to be no month when *Edusa* was not observed in the plains.

Passing to Cyprus, we find the Cypriot race described* as a little above the average size, and very common from March to November. I may say *en passant* that I have never seen an example of *helice* or *pallida* of the first spring brood, but unless it is a warm seasonal form, I see no other reason why it should not occur. Dr. Verity has figured ('Rhopal. Palaearet.', pl. xlvi, fig. 11) a ♀ *vernalis-aubuissoni* which is decidedly a transition form to *Helice*. In Lower and Middle Egypt, Major P. P. Graves says ('Bull. Soc. Ent. d'Egypte,' 1915, p. 150) that while *Edusa* may be taken any month throughout the cultivated areas, it is most numerous in winter, as one might expect, the imagines from well-matured larvae feeding on "bersim," a species of clover. But though he does not date the *Pallida* observed, "sometimes exceptionally large," it is most likely they fly at the time when the vegetation is luxuriant, viz. in (our) winter months.

In North Africa the Rev. E. A. Eaton ('Ent. Mo. Mag.', xix, p. 43) records a female on the wing at Algiers apparently ovipositing, and it was encountered there, and inland to Biskra in February by Miss Fountaine when collecting in these regions; M. Oberthür's collection includes January examples from the same localities; Lord Rothschild reports others at 3300–3600 ft. on the Hauts Plateaux in April and May ('Nov. Zool.', xxi, p. 307, 1914). The Algerian males vary from rather pale yellow to bright orange yellow, and, with the females, often constitute intermediates to *Helicina*, Obthr.

In a very useful paper published in 1919 in the 'Entomological Record,' Dr. Verity discusses the seasonal appearances of *Edusa*, and it is clear from his remarks that, given favourable weather conditions, the butterfly emerges continuously throughout the year in and up to Central Italy (Tuscany), and with this peculiarity that, whereas the second main emergence is of typical

* "The Butterflies of Cyprus," H. J. Turner, 'Trans. Ent. Soc. Lond.', 1920, p. 184.

+ "The Varieties, Various Modes of Emergence, and the Number of Broods of the *Grypocera* and of the *Rhopalocera* of Southern Europe, illustrated by Tuscan Specimens," p. 87, and collection, p. 121.

form, the third is only partly so. From mid-October onwards, and after the tardiest females of the third generation have put in an appearance, males emerge with all the characters of the *gen. verna.*, followed in due course, and when days are mild, by corresponding females. Here then the *gen. verna.* lasts from October to May. In June comes a new and typical generation, followed in August and to mid-October only by another typical brood.

Working northward from Tuscany, Dr. Ubaldo Rocci devotes a long paper in his interesting and instructive "Osservazioni sui Lepidotteri di Liguria"** to the phenology and racial characters of *Colias edusa* in Liguria, and gives a formal name—*autumnalis*—to the autumnal form, noting that the three forms as they occur in the region of Genoa are distinguishable, though the first autumn emergence is differentiated only in minor degree, as compared with the vernal, from the *gen. aest.*

With regard to the vernal form, I need say no more than that he agrees with Dr. Verity's diagnosis, adding that, whereas in some seasons *vernalis* is common, and the characters of the form strongly accentuated, in others it is rare, and the distinguishing characters little in evidence. He considers that the summer (typical) form has two generations—one from May to about the middle of August, the other from the end of August into September—and the Ligurian examples are larger than those of Piedmont.

It becomes increasingly interesting, therefore, to trace and determine the northern limits of the form *vernalis*, and further to ascertain the continuity of the form within such limits. The earlier French collectors and authors do not appear to have recorded the first flights of *Edusa* on the littoral, probably because their knowledge was confined to the second (*gen. aest.*) emergences. De Graslin, it is true, states (1862) that a form closely resembling *Chrysotheme*, Esp., occurs at Collioure, Pyr. Or., and this should correspond with the normal form *vernalis*. M. Rondou, whose own observations are rather of the Central Pyrenees, also makes no mention of a spring race, nor does he cite var. *Pyrenaica*, Gr. Gr., which seems likely to be the ab. *minor* of Verity, and of the same early spring form. But though the records are indefinite—Mabille in his 'Aperçu des Lépids . . . de l'Andé' (1885) specifies no date of emergence for *Edusa*—it may be assumed from the known meteorological conditions prevailing in the western Mediterranean that the species maintains itself along the Spanish seaboard, and along most of the coast from the Pyrenees to the Alpes-Maritimes, in a succession of broods throughout the year at sea-level and in the plains as upon the French Riviera, with the possible exception of that part of the Bouches-du-Rhône where the conditions are less favourable. At

* 'Atti Soc. Ligustica di Sci. Nat. e Geog.', Anno xxx, N. 4, 1920.

all events, M. Foulquier ('Cat. des Lépids. des Bouches-du-Rhône,' 1899) contents himself with the observation "March to October." I should be inclined to think—and my personal observations of the species support my view—that the continuous, or even occasional, appearances in winter of the imagines extends no further than the littoral, and is only possible in very favoured localities north of the line which divides the Midi from the central regions. Nothing like a systematic search of the in-coast Departments has yet been carried out by French lepidopterists. Millière hardly touched even the eastern fringe of Ardèche; Gard is *terra incognita* except the famous Pont-du-Gard locality; and the same may be said of Hérault, which since the days of Rambur, and a solitary visit long ago of the Entomological Society of France in early summer to Montpellier, has been left severely alone, and most undeservedly, so far as published observations are concerned.

On the French Alpes-Maritimes Millière does not help us. His allusions to *Edusa* are hopelessly incomplete; nor is Bromilow ('Butterflies of the Riviera') much more explicit with May and June for the first flight, meaning, I presume, the progeny of the real *gen. vern.*, for I have taken the small form at Hyères in March, and it has been reported there in January and February (February 12th, 1892, 'Entomologist,' xxvi, p. 128) by Bromilow himself. The Hyères first (fresh) emergence is undersized, rather pale in colour, but not conspicuously dusky in the females as in those from the eastern Mediterranean. Guillemot* supports my view that *Helice* does not appear with the true *gen. vern.* of Southern Europe.

M. Oberthür, moreover, considers that in France *Edusa* is a stable species only as far north as the Loire valley (Central France)—that is to say, that it has its regular succession of broods to that latitude, but that beyond it, including, of course, Great Britain, it is represented by the progeny of migrants, whether or not a few in specially favoured localities survive the northern winter of abnormally mild years in the larval state. Mr. R. Adkin has discussed[†] the whole question of British immigration, and the probable lines of communication adopted, but in harmony with M. Oberthür's ascertained facts, a part of our incomers might have their origin on the French Mediterranean coast-to-central area, and not entirely in the more distant (but certainly not impossible) North African preserves of the species. Emigration there may be from North Africa, but it is not easy to understand why, in ordinary years, the flight in search of feeding-grounds for the future offspring, if that be the motive of migration, should reach even these boreal climes when the

* 'Observations sur Les Lépidoptères du Printemps,' etc., 1856 (?).

[†] 'Colias edusa in Britain,' 'Proc. S. London Ent. and Nat. Hist. Soc.,' 1914-15.

lucerne fields and clovers of all France are at disposition. At present we have no reliable evidence that the *Edusa* on the wing in the Rivieran winter months is a wanderer. The evidence of its stability as a continuous-brooded species hereabouts is all the other way. Further, there is, I believe, no authority for the hibernation, *sensu stricto*, of the imago in this or any other locality.* The emergence of the autumn generation, September, October, November, may be finished at the end of the latter month, and oviposition is not likely to take place later; but the imagines may continue on the wing (both sexes) in December and January, and until worn out in the ordinary course of Nature. Commander J. J. Walker ('Ent. Mo. Mag.', xxiv, p. 176) observes that at Gibraltar there is scarcely a sunny day in any month on which *Colias edusa* may not be met with in sheltered places, and Tutt,* rightly, I think, draws the conclusion that during the winter the larvae of the Mediterranean first brood are feeding simultaneously, with only a very short pupal period.

On the other hand, judging from the appearance and size of the immigrants arriving in England in May, when the second French Riviera generation is as yet not fully developed, it is, in my opinion, open to doubt whether after all our *Edusa* are partly the offspring of these parents, as also presumed by Tutt (*op. cit.*, ix, 280), but are typical *Edusa* derived from and impregnated in remoter and warmer regions where the mean temperature of the winter is higher, for though by no means unusual, male *Edusa adrena* are rare in the United Kingdom. Tutt collected carefully all the evidence to date (1899) in the matter of *Colias* migration, and the reader may be referred in relation to this habit of the genus to his papers on "The Migration and Dispersal of Insects Lepidoptera," published in the 'Entomologist's Record' in 1900 (vol. xii, pp. 70-72). He does not touch on the sex question, and the records of the great *Edusa* year (1877) in the 'Entomologist,' vol. x, pp. 187-190, 209-10, etc., are not very helpful, as observers in most instances are equally reticent. We have authority, however ('Entomologist,' *loc. cit.*, p. 210), for captures *in cōp.* in such widely separated localities as Hants and Berwickshire in June; but Carrington's conclusion is that these were the results of successful intra-insular hibernation of the pupa, since apparently at this date it was not known to British entomologists that *Edusa* passes the winter proper in the larval state, and though capable of enduring slight frost (which *Hyale* is not), is incapable of sustaining life through a normal English winter. Be this as it may, I think the significant abundance of the species in the early part of the year in Cornwall at Land's End, and the records referred to, point to migration of both sexes, aided or not by the progeny of the previous year's migrants. In 1878 *Edusa* was reported on April 18th between Reading and

* "How *Colias edusa* Winters," 'Entomologist's Record,' vii, pp. 250-253.

Oxford, and at Ryde, I.W., on April 22nd (*op. cit.*, xiii, p. 116), but generally speaking it was conspicuous only by its absence in that year. A typical spring generation in the strict sense is, therefore, unrecorded and unlikely to occur in Britain of the form I have mentioned from the Mediterranean region, which has been named Stauder.

(i) *Gen. vern. vernalis*. Verity (1906) = *Mediterranea*, Stauder (1913). Costa bright rose-coloured and more brilliant than in the *gen. aest.* Ground-colour paler, marginal bands sometimes much enlarged; on the contrary, sometimes narrow, and the nervures therein as in *Chrysotheme*, sp. Hind wings ♂ and ♀ very green; underside powdered bright green. Fringes light violet-rose; the series of anterior marginal spots strongly accentuated from costal to anal margin; hind wings with violet tint.

(ii) *Gen. aest.* The southern second generation and parents of our August emergence. Typical *Edusa*.

(iii) *Gen. autumn.* (= *forma autumnalis*, Rocci). Confined normally to the southern regions, and more or less typical, though often reduced in size. Parents of the *gen. vern.*, with late emergences probably continued to the advent of this form.

? (iv) Viz. the late autumn form, which is that, or approximate to that, of *vernalis*.]

(To be continued.)

SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

By F. C. WOODFORDE, B.A., F.E.S.

(Continued from p. 93.)

TRIFINE.

Eremobia ochroleuca.—Series of 40, 26 of which have data. Twenty-five are from Kent and Essex. One from the Champion Collection is labelled "bred Guildford."

Trachea atriplicis.—Twenty-seven, most of them from the older collections and without data. Two from the Norgate Collection, presented by Mr. B. H. Crabtree, and three from the Meldola Collection are labelled "Cambridge."

Valeria oleagina.—A single specimen, slightly damaged, from the Hope Collection. This is probably the specimen taken July, 1800, by Mr. Donovan near Fishguard, in Pembrokeshire. See 'Barrett,' vol. iv, p. 330.

Luperina testacea.—From the Meldola Collection. Is a very dark brown specimen, almost black, in which usually markings are almost invisible. It is labelled "Lancs, St. Anne's-on-Sea, bred 17.8.12."

L. guenéei.—Over 40 with full data from St. Anne's-on-Sea.

L. dumerili.—A specimen from the Spilsbury Collection without data.

Hama abjecta.—Thirteen with full data from Hants, Kent and Essex.

H. furva.—Nineteen with data. A series of 7 from the Meldola Collection labelled "Surrey, Banstead, 7.04." The rest from Scotland.

Apamea pubulatricula (connexa).—Twenty-four, 4 with data. Three from the Sellon Collection labelled "Sheffield, 1890"; 1 from the Meldola, "Barnsley, 1890, Maddison."

A. ophiogrammea.—Nineteen with data from Surrey, Cambs, and Middlesex.

Aporophyla lutulenta.—Thirty-three with data. Two var. *luneburgensis* from Scotland. Two var. *selei* without data from the Spilsbury Collection.

Polia xanthomista.—Twenty-four with data. Of these 2 are from N. Devon, taken by Dr. Dixey—one September 15th, 1890, recorded in the 'E. M. M.', 1893, p. 87; the other September 28th, 1898. Of the rest 8 are from N. Cornwall; 14 from the Isle of Man; 6 presented by Mr. E. D. Bostock; 2 from the Meldola Collection; 6 from the Robertson Collection (bt. Stevens).

Trigonophora flammea.—Twenty-three, 10 of them with data. One from the Hope Collection is labelled "Bramber Castle." One from the Meldola Collection, "Sussex, Balcombe Wood, Octr. 24, 1871"; others from the same collection, "Sussex, Lewes." Four from the Champion Collection, "Sussex, 187??"

Hydræcia lucens.—Twenty-three with data from Lanes, the Lake District and N. Staffs.

H. paludis.—Fourteen, all from the Meldola Collection; 8 labelled "Sussex, Bognor"; 4, "Kent, Deal"; 2, "Lanes, St. Anne's."

H. crinanensis.—Eight specimens. Two from the Meldola Collection labelled "Inveran, fr. L. W. Newman." Six from "Near Thursby, Carlisle, Aug., 1920, examined and certified by the Revd. C. R. N. Burrows." Presented by the Rev. H. D. and Mr. E. B. Ford.

Nonagria cannae.—Twelve with full data, all from Norfolk.

N. sparganii.—Sixteen with full data. Three of them are from the Meldola Collection, one of them being the specimen taken in Deal in 1884, mentioned in 'Barrett,' vol. v, p. 83, and recorded in 'Entom.', 1884, p. 253; and in 'E. M. M.', 1884, p. 135.

Sentia maritima.—Twenty-seven with data. Six from Whittlesea, presented by Mr. J. Peed. Eighteen from the Robertson Collection (bt. Stevens), which include 2 var. *bipunctata* and 2 var. *wismariensis*.

Tapinostola extrema.—Twelve with full data from Northants and Huntingdon.

Synia musculosa.—Two from the Spilsbury Collection without data.

Leneania faricolor.—Three specimens. One from Sheppen, presented by Commander J. J. Walker. Two from the Meldola Collection, labelled "N. Kent, 1911."

L. obsoleta.—Five with data. Three from the Meldola Collection, labelled "Ely." One from Whittlesea, presented by Mr. J. Peed. One from the Champion Collection, labelled "Ely."

L. brevilinea.—Twelve with data. Three v. *sinelinea*, Farn.

L. putreseens.—Twenty-one with data, all from Torquay.

L. unipuncta (*extranea*).—Two specimens. One from the Meldola Collection, labelled "Walmer, 1. 9. 78," recorded in 'E. M. M.,' 1878, p. 107, and mentioned in 'Barrett,' vol. v, p. 163. One taken by the Rev. G. Hughes in the New Forest, 8. 10. 96, recorded in 'Entom.,' 1896, p. 333.

L. ritellina.—Four with full data. Three from the Meldola Collection, taken in Sussex, and one from S. Devon.

L. albipuncta.—Eight with full data. Six from the Meldola Collection; 4 taken in Sussex, 2 in Kent, and 2 from S. Devon, taken by the Rev. G. Hughes.

L. turca.—A long series from the New Forest.

Caradrina exigua.—Seventeen with full data, most of them from S. Devon.

Acosmetia caliginosa.—Seventeen specimens, but only 4 with data, from the Meldola Collection, labelled "New Forest, 1877-78."

Pachnobia leucographa.—Twenty-one specimens, 6 with data, from Wales, Surrey and Yorks.

Teniocampa gothica.—A long and very varied series, with full data, including several v. *gothicina* and intermediate forms.

T. incerta.—A long and interesting series. A very remarkable aberration from the Spilsbury Collection, without data.

T. opima.—Sixteen with full date. Five from Wyre Forest taken by myself. Four labelled "Lewes" from the Sellon Collection. Seven from the Meldola Collection, labelled "Lanes, St. Anne's-on-Sea."

T. gracilis.—A long series, including 40 specimens of var. *rufescens*, Cockerell, from the New Forest, bred by myself. These show a very great amount of variation in colour, from light greyish pink to very dark brown.

Dicycla oo.—Fifteen specimens with full data, including 5 var. *renago*, Haw.

Calymnia pyralina.—Thirty-seven with full data from S. Wales, Surrey and Middlesex.

Cosmia palaeaca.—Five specimens with data. Four from the

Champion Collection, labelled "Sherwood Forest, 1872." One from the Meldola Collection, labelled "Ross-shire, Fortrose, 1903, found in a spider's web."

Plastenis retusa.—Sixteen specimens with data from various localities.

P. subtusa.—Twenty-one specimens with data.

Cirrhædia xerampelina.—Four specimens with data. One from Cornwall, one from Oxford, one from Cambridge, and one labelled "Wales, 1888."

Ochria aurago.—A series of 40 with full data, showing much colour variation.

Mellinia ocellaris.—Five specimens with data. One from the Meldola Collection, labelled "Twickenham, Sept., 1893. 'Barrett,' vol. v, p. 397." The other 4 are also from the Thames Valley.

Orrhodia erythrocephala.—Three specimens, of which two are from the Spilsbury Collection with no data. The third from the Carden Collection (bt. Stevens, 1919), is labelled "Kemp-Welch Collection."

O. rubiginea.—Fifty specimens with full data, nearly all bred specimens, from various collections. One from the Meldola Collection is of an almost uniform brown without the usual irroration.

(To be continued.)

NOTES ON LEPIDOPTERA AT ALTON IN 1920.

By E. A. C. STOWELL.

(Continued from p. 123.)

HETEROCERA.

Once again the oak trees in Alice Holt were absolutely denuded by *Tortrix viridana*. This is, I am told, the third time in four years, and one wonders how the other spring oak-feeders survive. They certainly were scarce this year, though I took one *Boarmia roboraria*. It occurs to me that this may explain the cannibal propensities of *Cosmia trapezina* and *Eupsilia satellitia*, both oak-feeders by preference. Failing leaves they must needs eat the larvæ that have eaten the leaves. I find confirmation of this view in the fact that the closely allied elm-feeding *Cosmiae* show no such inclination—at any rate, I reared a number of *C. agnitis* this year in a small jar without any ill effects. The sallow blossom yielded only common things, especially *Tæniocampa pulverulenta*, which outnumbered everything else by twenty to one; however, I got a nice set of *T. munda*. Sugar in June at the foot of the Downs produced *Xylophasia sublustris* and common things, but in the Holt not an insect came, and in the autumn both sugar and ivy blossom were utterly devoid of insects, nor were there any larvæ to be beaten. Some moths came to light at midsummer, the best being perhaps *Neuria reticulata*, which came

on three evenings. In the autumn nothing came on the most favourable nights but a few *C. lychnidis* and *H. micacea*. It was in fact a wretched season for imagines, though I discovered *Epione adrenaria* at Selborne, and, in a swamp by the river here, *Leneania straminea*, *Acidalia immutaria* and abundant *Nudaria senex*. The most profitable work was larvæ-beating in the early summer. The oaks were hopeless as one only filled the umbrella with the exuviae of *T. viridana*, so I attacked the chalk flora, and elematis, buckthorn and maple yielded everything I expected. Most noteworthy were *Eupithecia inturbata*, May 14th on maple trees. *Ptilophora plumigera*, four on May 31st. Three of these emerged within twelve hours November 8-9th, a remarkable piece of timing! They do not appear to have a fixed time of day for emergence. One was drying its wings at 11 p.m., another was out by 8 a.m., and a third in the course of the morning; the fourth also emerged in the morning, a few days later. This species may be commoner than is supposed. The larva is a common looking thing, with none of the characteristics of a Notodontid larva, and they were full fed by the end of May. I also beat four larvæ of *Lophopteryx cuculla*, three very small on July 5th, and one larger later on. One small one produced a host of Chalcid flies, two were presumably injured in beating and went mouldy, and only one pupated. These larvæ when very small are distinctly bristly, a fact which I do not find mentioned in the books. They are, however, unmistakable when closely examined.

Emergences must have been protracted this season and I had an interesting illustration. I found a ♀ *Dicranura vinula* on a poplar trunk on May 9th. On July 27th a boy brought me an infant larva which I assumed to be *Cerura bijida* from the date, until it began to attain such portentous dimensions that at last it dawned upon me that it was *D. vinula* after all. One other experience had its humorous side. I found a winter nest of *Euproctis chrysorrhœa* on the cliff at Ventnor on April 19th and took it home. Though no bigger than my fist the number of young larvæ that emerged from it was positively alarming. They are not pleasant to handle and were a real *embarras de richesse*. I did not like to turn either larvæ or imagines loose, for if they took possession of the neighbouring orchards I should find myself unpopular next year. So after setting what I required, I let the rest live their life out in the cage. Strange to say, none paired, or at any rate deposited any ova.

On looking back over my notes I see that I took *Eupithecia pusillata* flying on April 3rd, a very early date. Also on May 15th in a spruce wood at Tisted I found *E. pusillata* common, and what I take to be the true spruce-feeding *Thera variata*.

NOTES AND OBSERVATIONS.

DUSKY MALE FORM OF DRYAS PAPHIA.—I have lately compared the males of *Dryas paphia* taken last year in the Bucks. Chiltern Hills with examples in my collection from numerous localities at home and abroad. Those from the New Forest and Monkswood, and from the Chilterns in former years, are all of the usual foxy or fiery red-brown to light bright brown colour, and the same may be said of the continentals extending in observation, east to west, from the South Carpathians to the South-west Pyrenees. The duskiness is chiefly in the basal area of the fore and hind wings, and due to the darkening of the hairs therein. *D. paphia* is not common, as a rule, at the particular spot chosen for observation, but in August, 1920, it was wide-spread and frequent together with *Argynnis cydippe* (for many years also scarce hereabouts and in one or two wanting, or, at least, so rare as to have been overlooked), the dusky form being predominant and in some places the only form on the wing. Male variation of this species, other than by failure of pigment, is rare in my experience; but it is noteworthy that in nearly all examples of Argynnids and Brenthids from Central France, Auvergne and the Cevennes, I detect an inclination towards a clear clay ground-colour—that is to say, in a direction precisely the opposite of the Chiltern *paphia*. On the other hand, as far as I can see, the Chiltern females were normal. Otherwise I might have been led to conclude that the duskiness of the males is attributable in some way to the damp and unsettled weather which prevailed during their pre-imaginal stages, though, of course, the dark form *valesina* occurs with the typical light females in the New Forest and elsewhere, whatever may be the meteorological conditions during development. I have never heard of *valesina* in Buckinghamshire. If any collectors have met with it in the county will they kindly notify the fact without mentioning the exact locality of capture.—H. ROWLAND-BROWN; Harrow Weald, May 1st, 1921.

ON THE APPEARANCE OF ANOSIA PLEXIPPUS IN BRITAIN.—Hitherto it has always been considered that the occurrence in the British Isles of *Anosia plexippus* has so far as known been due to voluntary immigration. But, as I have previously stated ('The Field,' April 17th, 1915), it is probable the specimens which have been seen and captured in this country have received assisted passages across the Atlantic on board ships. But at that time no proof existed as no observations of the kind had been recorded. It is therefore with considerable interest that I am now able to place on record the following facts regarding the appearance of this American species in England under certain conditions, but whether such applies to all the thirty specimens observed and captured in the British Isles and others elsewhere in Europe cannot be ascertained. For the following very interesting facts I am indebted to Mr. Geo. B. Pearson, who writes to me as follows: "While crossing on the way to Jamaica I learned that the purser of the boat (Mr. F. W. Buxton) was a collector. I soon made friends with him and asked him the question how *Anosia plexippus* gets over to England. He at once said, 'I will tell you. When we leave Norfolk, Va., in the autumn there are

always a lot of them flying about the potato locker, which is on deck. There are so many of them that they get shut in, and live on such nourishment as they can extract from the potatoes; when they arrive in dock in England they escape. Last summer we had two all the way over that never left the ship until we arrived at Tilbury, and I saw them fly away there.' " Possibly this may account for the extreme scarcity of this species in Ireland—as it may be remembered the only specimen known to have occurred in that country was one captured by Major Chavasse in Co. Cork in October, 1916, and recorded by me in the 'Entomologist,' vol. xlix, p. 285; otherwise it might be supposed that the western coast of Ireland would be the most accessible landing place for these insects after their flight across the Atlantic had they migrated without assistance. In any case the above interesting communication throws a new light on this subject, and my thanks are due to Mr. Pearson for very kindly bringing it to my notice.—F. W. FROHAWK; May, 1921.

CELERIO EUPHORBLE MAURETANICA, STGR., IN PORTO SANTO.—This fine sphingid is not uncommon in the Island of Madeira, where I found the larva in 1879. In January of the present year I observed a larva on narrow-leaved spurge in Porto Santo, north of Villa Baleira. This is, I think, the first record of a sphingid from that island. The larva was about 35 mm. long; true legs black, claspers red; caudal horn black, reddish at base; lateral pale yellow stripe with red spot on each segment; dorsal yellow line narrow and interrupted; sublateral large spots transversely elongate, black, with large white pupil; broad sublateral band of yellow dots, its upper edge level with the white pupils of the spots; head dark red. According to Rebel's recent (1917) revised list, there are only four Madeira sphingidae in addition to the above—*C. livornica*, Esp., *Herse convolvuli*, L., *Acherontia atropos*, L., and *Macroglossa stellatarum*, L. The Azores have only *A. atropos*, *H. convolvuli*, *D. nerii* and *M. stellatarum*. There are no local subspecies, and it is not unlikely that some of the species at least have been introduced by man. The poverty of these islands in the larger Lepidoptera is also shown by the absence of Arctiidæ in the Azores, while Madeira has only the wide-spread *Deiopeia pulchella*, L. There are no Hesperiidæ in Madeira or the Azores so far as known.—T. D. A. COCKERELL.

THE EARLY SEASON.—We have just passed through a remarkably mild winter with scarcely any frost. But it is a curious fact that on December 11th and 12th we had the heaviest fall of snow that has occurred during the thirty-six years I have lived here. It was nearly calm at the time and the snow came down straight, and covered the ground evenly to the depth of nearly a foot. On the 13th a rapid thaw set in and in less than twenty-four hours it had all disappeared. Since then the weather has been simply wonderful, and for the past month, day after day, the sky has been cloudless, with wind varying between S.E. and N.E., fresh at times and rather keen, but with the temperature generally well above the normal. There has been no rain to speak of since November and the country is getting very dry. I noticed white-thorn bursting into leaf as early as January 28th, and at the present time the woods and hedges are as forward as they

usually are about the middle of May. Yesterday I saw a horse-chestnut in full bloom. This tree is always a fortnight or three weeks earlier than others growing near it—why it is impossible to say, unless, perhaps, its roots may be near some warm spring. *Pieris rapæ* and *P. napi* are not as numerous as they were this time last year. I saw the first on March 25th, but they were probably out before this. *P. brassicæ* I have not yet seen, but last year I saw one on March 20th, which I think is a pretty early record. Two *Smerinthus ocellatus* were seen “paired” on a post on April 9th—a very early appearance. Several *Chrysophanus phœas* were flying about the railway bank near Dovercourt Station on the 10th, and *Phlogophora meticulosa* was noticed sitting on a fence on the 11th. On March 22nd I visited Stour Wood for a few hours where I saw several *Brephos parthenius* flying round the young birch trees, and *D. fagella* was plentiful on the oaks—six or seven often close together on one tree, and there were some nice varieties. Larvae of *Arctia villica* are about a month earlier than last year. I took the first full-grown on March 15th and continued to find them up to the 12th instant, and have now a good number. They commenced to spin up on March 27th, and more than half are already in the pupa state. I hope I may breed some good varieties.—GERVASE F. MATHEW; Lee House, Dovercourt, April 13th, 1921.

EARLY LEPIDOPTERA.—*Pieris rapæ* and *Aglais urticæ* were seen flying on March 24th, and a male *Euchloë cardamines* was taken on the 25th. On April 9th *Celastrina argiolus* was noted at Hove, and two specimens of *Phlogophora meticulosa* were captured. Specimens of *Xanthorhoe unangulata* were seen and a female netted on April 12th, and on the 13th of that month a female *Phrygmatobia fuliginosa* was secured.—F. G. S. BRAMWELL; 1, Dyke Road Drive, Brighton.

PYRAMEIS ATALANTA IN MARCH.—On March 26th last I noted a specimen of *P. atlantæ* at Bookham Common. There seems no doubt that it had hibernated here.—R. N. GOODMAN, M.S.; Kingston-on-Thames.

RETARDED DEVELOPMENT OF CŒNONYMPHA TIPHON.—In the March number of the ‘Entomologist’ for the year 1920, vol. liii, p. 66, I recorded the retarded development of five larvae of this species. Although three of these lived through their second winter only one finally survived to pupate; this took place at the end of May, 1920, and produced a perfect female butterfly on June 16th, 1920. The larval state occupied 21 months 2 weeks. The complete metamorphosis extended from the middle of August, 1918, to the middle of June, 1920.—F. W. FROHAWK.

EARLY APPEARANCE OF CELASTRINA ARGIOLOUS AND PIERIS BRASSICÆ. On March 24th last I saw a male *Celastrina argiolus* on the wing, this is the earliest date I know of for this species to make its appearance. At the same moment a male *Gonepteryx rhumni* and an *Aglais urticæ* were flying over and feeding on dandelion flowers. On April 1st *Pieris rapæ* appeared and on the following day I saw *P. brassicæ* on the wing, which is a very early date for the latter. The weather on all three days alluded to was fine with cloudless

skies and a temperature of 61, 56 and 62 degrees respectively.
—F. W. FROHAWK.

HESPERIA MALVAE, ETC., IN APRIL.—On April 12th I took seven specimens of *H. malvae* and one specimen of *Callophrys rubi* on a sunny piece of down near here. I thought this might show what a very early season this must be. I wonder if any readers of the 'Entomologist' have taken either of these species as early as this.—J. M. JAQUES; The Red House, Banstead, Surrey.

EARLY BUTTERFLIES.—The following early appearances this year are perhaps worth recording: *Euchloë cardamines*, Balliol College quadrangle on April 2nd; *Pyrameis atalanta*, Bloxworth, Dorset, on April 13th (several flying about wallflowers, etc., among scores of *Vanessa io*).—A. W. PICKARD CAMBRIDGE; Balliol College, Oxford, April 15th, 1921.

AGROTIS SEGETUM IN MARCH.—A specimen of *Agrotis segetum* (apparently fresh) was taken at sallow blossom on March 22nd last. Mr. Capel Hanbury was with me at the time.—G. VERNON BULL, M.D.; Montagu House, Hoddesdon, Herts.

GONODONTIS BIDENTATA IN MARCH.—On March 27th a specimen of *G. bidentata* came to my moth trap. In 1914 the first appearance of this species was on May 4th.—FREDERICK GILLETT (Major); Cheriton House, Sevenoaks, Kent.

EARLY EMERGENCE OF COREMIA UNIDENTARIA.—On March 23rd I took a male specimen of the above insect on a fence in Oxshott village. The identification has been confirmed by Mr. H. Worsley-Wood.—F. G. MANN; 9, Parker Street, Cambridge.

HYLOPHILA PRASINANA IN MAY.—While collecting on May 10th last I took a fine female specimen of *Hylophila prasinana* at rest on a fence in Harpsden Wood, Oxon. This wood is principally composed of beech trees, with a few birch and oak in one clearing. The date seems to be a very early one for this moth.—STANLEY N. A. JACOBS; 5, Exbury Road, Catford Hill, London, S.E. 6.

THERONIA ATALANTE, PODA, IN BRITAIN.—When naming some ichneumons last winter I discovered a specimen of this fine insect which was taken or bred by my father, probably in the Colchester district, some twenty or twenty-five years ago. The only known British specimens are 2 ♂ and 2 ♀ in the Stephens Collection and a single specimen taken near Folkestone ('Entom.', 1909, p. 65), all of which are at S. Kensington.—BERNARD S. HARWOOD; Sudbury, Suffolk.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, February 2nd, 1921.*—The Rt. Hon. Lord Rothschild, F.R.S., President, in the Chair.

The President announced that he had nominated the following fellows to be Vice-Presidents for the ensuing year: Mr. G. T. Bethune-Baker, Mr. J. Hartley Durrant, and Commander J. J. Walker, R.N. He also announced that three Committees—Finance,

Publications, and Library—had been formed in place of the Business Committee, and the names of the Fellows appointed to serve thereon respectively.—Mr. A. Bacot exhibited living specimens of *Cimer hirundinis*, and gave an account of his breeding experiments therewith.—Dr. K. Jordan exhibited examples of the Saturnian genera *Holocera*, *Ludia*, and *Orthogonioptilum*, and demonstrated the presence of a kind of stridulating organ, absent in the males; also two species of *Graphipterus*, *Gr. rotundatus*, Klug, and *Gr. peletieri*, Casteln., from Algeria, both provided with stridulating organs. He said that the latter was found in association with *Cicindela touquii*, Guer., and that although the difference was apparent in the cabinet, in Nature they were practically indistinguishable.—Dr. C. J. Gahan remarked on the great interest of the discovery of these organs in the female *Henucha*, the only other instance known to him being that of *Phonaphale*, a genus of beetles of the family *Bostrichidae*.—Mr. O. E. Janson exhibited a fine specimen of *Markia hystrix*, Westw., a rare and remarkable locust from Costa Rica.—Prof. E. B. Poulton, F.R.S., a case of butterflies and mimetic moths which had been observed migrating together from one valley to another in Selangor, F.M.S., and read a letter from Mr. A. R. Anderson, the observer and captor, as to the conditions under which the exhibited specimens were taken. Prof. Poulton also exhibited a female *Hypsa (Asota) alciphron*, Cram., which after inspection had been rejected and neglected by Geckos from Lampur, F.M.S., also examples of *Musca autumnalis*, De G., found hibernating as in previous years at St. Helens, I.W. The numbers appeared to be greater than in any winter except that of 1914–15 (cp. ‘Proc. Ent. Soc.’, 1915, p. 21).—Mr. H. J. Donisthorpe brought for exhibition a number of workers of *Acanthomyops (Dendrolasius) fuliginosus*, all of which had workers of *A. umbratus* fastened by their mandibles on to their legs, etc., taken at Woking in August, 1915, when a fierce battle was in progress between the two species. It served a good opportunity to establish how soon the Myrmecophils enter the new nest, and those observed in the five ensuing years were also exhibited.—Mr. Lachlan Gibb showed several forms of the female of *Chrysophanus dispar rutilus* bred by Capt. Bagwell Purefoy. After eight years’ experimental breeding in this country it was found that the blue sheen on the undersides of the species approximated more generally to that of the extinct form, but the broad orange band on the underside showed a tendency to diminish.—The following papers were read: “Notes on the Orthoptera in the British Museum: (1) The Group of *Euprepocnemini*” by Dr. B. P. Uvarov; “Notes on Synonymy, and on Some Types of Oriental Carabidae in various Foreign Collections,” by Mr. H. E. Andrews.

March 2nd.—This being the first meeting held at the Society’s new premises, 41, Queen’s Gate, South Kensington, S.W., the President, the Rt. Hon. Lord Rothschild, F.R.S., delivered an address of welcome to the very large number of Fellows and visitors present. Mr. F. C. Willett, of Sipetong, British North Borneo, was elected a Fellow of the Society.—The President exhibited a collection of gynandromorphous Lepidoptera, including examples of ♂ *Orgyia antiqua*, *Sciapteron dispar*, Stgr., and *Papilio (Troides) haliphron*; also

examples of British caught *Colias croceus (edusa)*, one having *helice* fore wings and normal hind wings, the other the right side *helice*, the left normal, and a ♂ right side ♂, left ♀ form of *Euchloë cardamines* from Epping Forest.—Prof. E. B. Poulton, F.R.S., brought for exhibition an example of marked irregularity in the colour adjustment of a *Pieris rapae* pupa to its surroundings; also the wings of the dragonfly *Eschna grandis* left by a sparrow which had attacked the dragonfly and eaten the body.—In the absence of the author, Prof. Poulton then read a paper by Dr. R. C. L. Perkins on "Variation in *Andrena rosae* and *Andrena trimerana*," illustrated by a long series of examples of both species.—Mr. G. T. Bethune-Baker exhibited specimens of *Lycaeninae* from Provence (France) to show the large proportion of those more or less leaden coloured taken in the summer of 1920. The scales seen under the microscope were found to be in all cases of the kind ill developed.—Mr. H. J. Turner exhibited an example of a Zygaenid sent him by Mr. Greer from Tyrone suggesting a natural hybrid between *Z. lonicerae* and *Z. filipendulae*; also series of the large form of *Z. filipendulae* occurring abundantly on Box Hill, in which the sixth spot was very weak, and the first to disappear from wear, together with an example of *Z. unceps* recently described by M. Charles Oberthur from Hyères and a short series of *trifolii albiana*, Obthr., from the same locality.—Mr. G. T. Talbot brought a number of specimens of *Euploea* from the Joicey Collection illustrating a supposed black and white mimetic combination in the Tenimber Islands, Fiji, and Australia; and a white-banded group in the Key and Aru Islands.—Mr. R. Adkin exhibited an example of *Margarodes unionalis* taken at sugar near Arlington, Sussex, a native of southern countries, and probably a migrant to our shores.—Mr. H. J. Donisthorpe exhibited strings of the so-called "ground pearls," being probably a *Margarodes* sp., *M. formicarum*, Guilding, from Jamaica, and two examples of a species of *Cionus* new to science, swept near Lake Windermere a few years since by the Rev. Canon Theodore Wood.—Mr. W. J. Pendlebury showed an unusually dark form of the Carabid beetle *Anchomenus dorsalis* taken in Brecon, and a variety of the mosquito *Theobaldia annulata*, first found in Mesopotamia, and described by Capt. Barrand, R.A.M.C., the specimen exhibited being from Earl's Court, October 27th, 1920, and given the varietal name (in MS.) of *subochrea*, Edwards.—Mr. W. G. Sheldon exhibited a series of 243 bred specimens of *Peronia hastiana*, L., from Sutherlandshire, Wicken Fen, the Isle of Wight and the coast of Lancashire. The series included most of the named forms, and a number of unnamed forms.—Dr. K. Jordan exhibited *Misurgina heta* from Madagascar, remarkable for its very strongly elevate antenna and the development of a stridulating organ. He compared the process with that occurring in other species of *Agaristidae* and *Noctuidae*. He said that *Misurgina* recalled *Pemphigostola*, Strand (1909), placed by the author with the *Castniidae*, but which would on re-examination probably turn out to be an Agarastid also.—The following papers were read: "Notes on the Rhopalocera of the Dollman Collection," by N. D. Riley"; "The Male Genitalia of *Merope tuber*, Newm. (*Mecoptera*), by F. Muir.

March 16th.—The Rt. Hon. Lord Rothschild, F.R.S., President, in

the Chair.—The President announced that the Rev. George Wheeler had been obliged to resign the Secretaryship on account of ill-health, and that the Council had elected Mr. H. Rowland-Brown in his place. A vote of thanks to Mr. Wheeler for his services, extended over ten years, was proposed by the President, and carried unanimously. The following were elected Fellows of the Society : Capt. K. J. Hayward, Aswān, Egypt ; Mr. E. Bolton King, Balliol College, Oxford ; Mr. L. M. Pears, West Virginia, U.S.A. ; Mr. E. D. Lewis, Swanley, Kent ; Mr. W. J. Hall, Cairo, Egypt ; Mr. D. Ponniah, Federated Malay States ; Mr. H. D. Hope, Jermyn Street, London, S.W. ; Prof. Dr. S. Matsumura, Japan ; and Prof. C. P. Alexander, Illinois, U.S.A. Prof. E. B. Poulton, F.R.S., exhibited series of butterflies from Central Peru to illustrate the mimetic relationship between *Heliocinus notabilis microclea*, Kaye, and *H. xenoclea*, Hew.—Mr. W. J. Kaye suggested that the palatability of the two was probably the same.—Mr. H. J. Donisthorpe gave an account of the latest views on the sub-families of ants, and illustrated his remarks with numerous diagrams.—In connection therewith Mr. W. C. Crawley exhibited representatives of each of the two groups separated by Wheeler, and remarked that the large termite ants could be heard by their kind.—Lt.-Col. Peile, I.M.S., brought for exhibition a collection of butterflies made by him in Mesopotamia. These included a new species of Lycaena, with the Blues which it was taken in company with : a new sub-species of *Zegris eupheme* = *dyala*, differing from var. *menestho*, Men., which occurs at Fathah on the right bank of the Tigris, in the absence of the yellow suffusion in the ground-colour of the hind wing, and from ab. *tschudica*, H. = S., in having more white in proportion to the green, and *Melitaea trivia persea*, Koll., the three seasonal forms from various localities in Mesopotamia and the North-West Frontier of India.—Mr. E. B. Ashby exhibited an example of *Papilio machaon rufopunctata*, Wheeler, from Les Voirons, Haute-Savoie, and a series of *Parasemia plantaginis* from the Col de Faucille above Gex, Ain, in the French Jura, showing a great diversity of variation. One specimen, he thought, might be referred to *matronalis*, but the President did not support this view, the melanism not being sufficiently pronounced.—Mr. G. Talbot, on behalf of Mr. J. J. Joycey, exhibited teratological aberrations of Lepidoptera, and a case containing several new forms of African Rhopalocera. The following papers were then read : “On Some Chrysomelidæ (Coleoptera) in the British Museum,” by Mr. A. M. Lee; “Types of *Heteromera* described by F. Walker now in the British Museum,” by K. G. Blair.—H. ROWLAND-BROWN, M.A., Hon. Secretary.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—February 10th.—The President in the Chair.—Mr. H. Main exhibited a contrivance he was trying in his breeding-pots to keep the earth damp and at the same time to avoid staleness and mould.—Mr. R. Adkin, a *Pieris brassice* with the black apices of the fore wings radiated by yellow streaks, taken at Eastbourne in August, 1920.—Mr. Hy. Turner, a series of *Selidosema plumaria* from Ireland, Co. Tyrone, including a curious streaked melanic male which he had named ab. *intermedia-fumosa*. He also showed a *Zygæna* sent by Mr. Greer from Co. Tyrone as a captured hybrid

between *Z. lonicerae* and *Z. filipendulae*, and pointed out its characteristics.—Mr. B. S. Williams, *Polyommatus icarus* ab. *clara* from Cornwall and Ireland.—Mr. H. Leeds, a very large number of undersides of female *P. icarus*, showing 130 named forms worked out by Tutt's 'British Lepidoptera.'—Mr. K. G. Blair, the bark-boring Scolytid beetles *Nyleborus dispar* and *N. sarenseni* from Kidderminster with burrows in plum-tree, and a *Heliocopris*, sp., from Siam with its dung-ball cut to show egg-cavity.

RECENT LITERATURE.

Memoirs of the Department of Agriculture in India. Vol. vi, Nos. 1-9, November, 1920. Calcutta: Thacker Spink & Co. London: W. Thacker & Co.

A SERIES of papers by the Imperial Entomologist, T. Bainbrigge Fletcher, R.N., F.E.S., etc., dealing with the Pterophorina, Tortricina, Tineinae and Micropterygina of India so far as the members are at present known.

About 430 species are here referred to. This would seem to indicate that one or more stages in the life-history of at least a sixth of the known species of these families occurring in the Indian Empire have been investigated.

There are 68 plates (some in colour).

Report of the Proceedings of the Third Entomological Meeting, held at Pusa, February, 1919. Edited by T. BAINBRIGGE FLETCHER. 3 vols., pp. xii + 1137, 182 plates. Calcutta, Superintendent of Government Printing, 1920.

THESE three volumes contain an almost verbatim report of the proceedings of the meeting, and cover practically the whole field of entomological work and organisation in India. The meeting was well attended, as the long list of papers—upwards of ninety—read before it clearly shows. The bulk of vol. i is occupied by an "Annotated List of Indian Crop-pests," by T. Bainbrigge Fletcher, the additional matter brought out in discussion being added throughout, and by the Chairman's opening address. Vol. ii mostly contains papers of purely economic interest, among which may be mentioned an exhaustive paper on the "Pink Bollworm in Egypt," by Dr. L. H. Gough, a short but interesting paper on "Some Problems in Forest Insect Control," by C. F. C. Beeson, papers on lac-culture, silkmoths, etc. Vol. iii has a number of papers of more general interest, dealing with such subjects as methods of collecting and preserving specimens, the importance of collecting, preparation of illustrations, by the Chairman, Dr. D. Sharp, Dr. Hankin, A. W. Slater and C. C. Ghosh, papers of systematic interest, such as that by W. Ormiston on the genitalia of the Hesperiidae of Ceylon, and short notes by Prof. E. B. Poulton, E. Meyrick and Major Fraser on special subjects, mainly Lepidoptera.

The Pusa Institute seems thus to aim at being the home of both pure and applied Entomology in India—a very excellent object. Its attainment would be welcomed alike by the professional and the amateur.

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VOL. LIV.]

J U L Y , 1 9 2 1 .

[No. 698]

COLIAS EDUSA, FAB. (*CROCEUS*, FOURC.) :
ITS SEASONAL FORMS, VARIETIES AND ABERRATIONS.

By H. ROWLAND-BROWN, M.A., F.E.S.

(Continued from p. 140.)

Dr. Rocci* distinguishes the late autumn Ligurian form from that of the *vernalis* form proper. The colour is deep yellow, without the greenish and pallid tint of *vernalis* (spring form). Marginal black bands broad, and of the deep black of the summer form, but less frequently invaded, in the males, by the yellow nervures. In the female the yellow blotches encroach upon the marginal border; they are a little larger, always well defined and complete, the black discoidal spot large and round. The normal flight of *autumnalis* is from the end of October to the middle of November in Liguria, some individuals surviving the winter in mild seasons, and eventually mixing with the true spring emergence.

Dr. Rocci further states that the *Edusa* of Piedmont in its successive emergences does not present as distinct characters as that of Liguria, and the *gen. autumn.* is exceptional. The alpine (single-brooded) form partakes rather of the *gen. vern.* character than of the *gen. aest.* of the plain.

While complete pale forms of the female (= *Helice*, Hb., and *Pallida*, Tutt) occur with (ii) and (iii), there is not yet sufficient evidence to establish a normal occurrence with (i), at least in the North Mediterranean region.

Dr. Verity now informs me that Herr Staëder's var. *Mediterranea* ('Boll. Soc. Adriat.', xxvii, pp. 105, etc., 1913) is identical with his own *vernalis*; the name therefore falls to it. Fritsch ('Zur Phænologie von *Colias crocea*, Fourc. [= *Edusa*, F.] neb-t ab. *Micans*', 'Iris,' vol. xxxix, pp. 40-45) mentions a February-March emergence distinguished from the type by its size, and constituting a so-called seasonal form throughout the area of distribution (Trieste?). Probably also Failla's ab. *minor* (♂ 33-♀ 44 mm.) may be included in *vernalis*, though small examples of both sexes are taken in all generations, and in some localities are consistent forms, as will be seen in my further remarks on ab. *minor* and var. *Pyrenaica*.

* "Osservazioni sui Lepidotteri di Liguria," Pieridæ, 2a Parte. 'Att. Soc. Ligustica Sci. Nat. e Geog.', Anno xxx, N. 4, 1920.

ABERRANT FORMS.

(A) *Forms Tending to Albinism.*

The oldest described and figured varietal form of *Colias edusa* is that figured and described by Huebner ('Eur. Schmetts,' 1, figs. 440, 441, 1803?).

(a) Ab. ♀ *Helice*, Hb. (= *europome*, Stephens). Until Tutt in 1896 invented *Pallida* for the white form, all pale aberrations of the female tending to albinism were lumped together under *Helice*. To take two authors only, Duponchel (vol. i, p. 48) says that the variety (*sic*) is distinguished from the type by the ground-colour of all the wings, and the spot in the marginal band being *whitish*; Barrett, that the *whitish* forms are known by the varietal name of *Helice*. A glance at Huebner's figures is sufficient to convince us that he meant to indicate a form in which the ground-colour was pale *creamy* white, *i.e.* with a tinge of yellow in the pigment. In fig. 440, as seen in the copy in the Library of the Natural History Museum, South Kensington, it is impossible to mistake this creamy tendency—the colour of a vanilla cream ice; but it is only very slightly so, and neither figure displays the same Chinese white used, for example, to depict the male of *Pieris brassicae* (fig. 401). Fig. 441 is even lighter, but still to my eyes separable from the extreme *Pallida* form. The creamy spots in the black marginal bands, of course, vary both in depth of colour and in number and size, as in the typical female. I believe no example of a male *Helice* or *Pallida* has ever been reported authentically, and the same remark applies to the other yellow species of the genus *Colias*. In Barrett's figures (pl. vi, 1c, 1e) both are decidedly cream coloured, 1c less so than 1e.

Ab. *Helice* is then properly described by Tutt as pale lemon or cream yellow. All British examples in my collection, taken at Bonchurch, I.W., August, 1877, correspond to this form. Twelve aberrations of the type are shown, but not numbered, on the excellent plate published in the 'Entomologist' in March, 1878.* In no one of the *Helice* forms figured does the coloration approach that of *Pallida*.

Ab. *Ridicula*, Alpheraky ('Hor. Soc. Ent. Russ.', vol. xxxviii, p. 519), a South European form, "white as *Helice*, but half as small again," hardly seems worthy of a name; if so, it may be considered generally under ab. *minor*, Failla, and Dr. Verity figures it as such ('Entomologist,' vol. xxxvii, pl. 4, fig. 4).

(b) Ab. *Helicina*, ♀, Oberthür (1880) ('Études Entomologiques,' xx^{me} livr., pl. vi, fig. 96; 'Rhopal. Palearct.', pl. xlvi, fig. 40). Ground-colour very pale yellow with bright saffron or rosy glaze. Intermediate between the typical yellow and the whitish forms. Described from an example captured in the author's garden at Rennes. There are two British examples in

* 'Colias edusa,' by Edward A. Fitch, vol. xi, pp. 49-61.

the Oberthür Collection—one from the New Forest, the other from Folkestone. A male form is suggested by pale-coloured examples (? = ab. *chrysosome*, Stgr.). I have one such caught by the late Rev. H. C. Lang in 1892 at Southend-on-Sea, Essex. It seems to occur on the Continent sporadically, and is stated to be rather rare in Algeria (*cp.*, however, under ab. *Tergestina*, Stauder, *infra*). With regard to the ab. *Aubuissoni* ♀, Caradja ('Iris,' vol. vi, pp. 171–2, "Grosschem. des Dep. de la Haute Garonne, 1893"), a point on which there appears to be some doubt (*cp.* Mr. Wheeler's remarks in his 'Butterflies of Switzerland,' p. 70), I note that M. Oberthür ignores the name entirely as being synonymous with his *Helicina*, though Dr. Verity retains it. It is advisable, therefore, to examine Caradja's diagnosis :

"Aberatio ochracea, alis posterioribus macula media permagna ochracea ; est forma intermedia inter *Edusam* et *Helicem*."

And he continues, "It is a form approaching *Helice*, but with all the wings more or less overlaid (*übergossen*) with bright orange, and in the intensity of the gold coloration more often resembles *Edusa*. The very large deep orange discal spot on the hind wings, which stands out conspicuously from the grey-dusted ground-colour, is also characteristic." In the figured *Helicina* the pale yellow is constant and pervades the ground-colour of the upper side. *Aubuissoni*, on the other hand, from the above description would seem to imply a transitory form to *Helicina* and through it to *Helice*. However, in my opinion it constitutes nothing more than a trivial colour aberration, and I see no reason to maintain a separate name for it. There is what appears to be a very curious *Helicina* × *Helice* hybrid, the last but one of the right-hand series illustrated on Mr. Fitch's plate (*op. et loc. cit.*), and again opposite this figure another with fore wings *Helice* and hind wings *Helicina* rather than *Edusa*. There appears also to be an intermediate Algerian form between *Helice* and *Pallida* with a greenish-white ground-colour described ('Lépid. Comparée,' fasc. x, p. 76), but for which M. Oberthür considers a distinguishing name superfluous.

[*(bbb)* Ab. ♂ ♀ *Tergestina*, Stauder (1913), is described by the author ('Boll. Soc. Adriat.,' vol. xxvii) as "the lemon-and-sulphur yellow aberrational form ♂ ♀." Dr. Verity comments (*in litt.*) : "This seems rather confused! The ♀ has the name of *Helicina*, Obthr., already. I have seen the type at Rennes, and it is of a bright lemon yellow. There is no ♂ form that corresponds. Pale males are simply weak individuals, and not a transition to the white *Helice* like the yellow females." I agree with Dr. Verity, to whom I am further indebted for the communication of Herr Stauder's several notes and other valuable information about the species under review. The name *Tergestina*, therefore, is redundant, and falls.]

(c) Ab. ♀ *Pallida*, Tutt (1896). The extreme white form

without a trace of the yellow or creamy white, and with bluish, not greenish, ground-colour. In my own experience abroad this form occurs more frequently than *Helice*. It was comparatively common flying in some rough meadows on the coast a little to the south of Guéthary, Basses-Pyrénées, in July, 1911, and my recollection of my hunt there with Mr. B. C. Warren is that the typical females were in a minority. Those in my collection are remarkable for the failure of the greenish tinge, which becomes bluish, culminating in ab. *Cerulea*, Verity. It would be interesting to have the views of our collectors on the relative proportion of the *Helice* and *Pallida* forms in the field. I do not remember to have observed the two pale forms together in Britain in the great *Edusa* and other years when the species has been abundant.

Is this the third ♂ aberrant form of M. Oberthür's list (*op. cit.*, fasc. iii, pp. 173-75)—“la couleur jaune du fond des ailes très pale”? If so, or even if this be referable rather to *Helice*, it would constitute an exception to the rule that the extreme white and whitish forms are confined to the female. This particular form is stated to occur in Sicily and Corsica.

(d) Ab. ♀ (*rel. forma*) *Albissima*, Ragusa. Ground-colour rather pale yellowish white, the median marking, hind wings, white, not orange. Appears to be intermediate between (b) and (c). Rare in Liguria (Rocei).

(e) Ab. ♀ *Cerulea*, Verity ('Entomologist,' vol. xxxvii, p. 54, 1904). This is an extreme aberration, in which, according to the author, the greenish colour of the underside of all the wings is replaced by sky blue with silvery reflections, but in the figure before me ('Rhopal. Palæaret.', pl. xlvi, fig. 32) it is nearly white, not blue at all. At all events it is one of the most remarkable aberrations of the species figured or described. It was taken on Monte Matanna, Apuan Alps. The greenish colour in *Pallida* is often pale greyish blue, but Dr. Verity is definite that this aberration is sky-blue, and the forms, therefore, should not be identical.

(f) Ab. ♀ *Adoratrix*, Stauder (1913). Described by the author as follows: “A further *Croceus pallida-and-helice* form, which bears a very broad marginal band on the upper side of the hind wings; in which, also, the light spots are nearly or entirely missing, and the band of the fore wings is very nearly entirely, or entirely unspotted, I designate as ab. ♀ *Croceus helice (pallida) adoratrix*, Mihi (types: 3 ♀ ♀ from Triest, mid-September, 1910-12) ('Boll. Soc. Adriat.', vol. xxvii, pl. ii, f. 4).”

(g) Ab. ♂ *Cinerascens*, Mihi (1921). A form of the ♂ in which the black markings tend to albinism, and are very pale grey, = No. 3 of the aberrations cited by M. Oberthür ('Lépid. Comparée,' fasc. iii, p. 173; 'Rhopal. Palæaret.', pl. xlvi, fig. 10, and 'Jahresbericht Wien Ent. Ver.,' 1903, pl. I, fig. 1).

(h) Ab. *Brunnea*, Tutt (1896). The black replaced by brown.
 (i) Ab. *Flavida*, Ksenzopolijsky (1912)? In which the normal orange yellow ground-colour (? both sexes) is tawny. Being unable to verify the reference in the 'Zoological Record,' I leave this aberration in doubt.

(j) Ab. ♀ (*vel. forma*) *Fulvognata*, Rocci (1920). A form of the gen. *cest.* only: spots in marginal band intense fulvous to orange (? ab. *Flavida*).

(k) Ab. ♂ *Deserticola*, Verity. A small form with very pale whitish-yellow ground-colour ('Rhopal Palæarct.').

M. Oberthür (*op. cit.*, fasc. x, p. 77) says that this form is by no means confined to the desert region of the Algerian Sahara, but is met with elsewhere as an occasional departure from the type.

(l) Ab. *Cremonæ*, Bang-Haas ('Iris,' vol. xxvi, p. 103). A colour form from the Lebanon, chiefly remarkable in that the normal orange colour is primrose as in *C. palæno* ♂ (= *Europomene*, O).

(m) Ab. *Chrysothemiformis*, Verity (1919). Form of the gen. *vern.* in Tuscany "identical with *Chrysothemis*, Esp., except for the patch of androconial scales in the ♂."

(n) Ab. ♂ *Passa*, Verity (1906). Ground-colour very pale yellow. Marginal bands very pale reddish brown. Differs from ab. *Brunnea*, Tutt (*q. v.*), which has the ground-colour deep orange ('Rhopal. Palæarct.', pl. xlvi, fig. 10).

(To be continued.)

OXIGRAPHA LITERANA, L.: ITS LIFE-CYCLE, DISTRIBUTION, AND VARIATION.

By W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 135.)

Ab. *romanana*, Fab. (Plate I, fig. 3.)

Synonymy.—*Romanana*, Fab. *Pyralis mantissa*, ii, p. 234 (1787); Fab., *Syst. Ent.*, tome iii, par. ii, p. 270, No. 119 (1794); Hübner, *Tort.* fig. 88 (1797) (*literana*); Hübner, *Verz.*, p. 386, No. 3748 (1826) (*notatana*); Snellen, *Vlinders*, p. 176, No. 4 (1882) (*squamalana*).

Original description.—*Pyralis romanana*, alis virescentibus albo scabris: lunula media atra. Habitat in Germania australiori. Mus Dom. Romani. Affinis præcedenti (*squamana*) alæ anticae virescentes punctis plurimus, elevatis, albis. In medio lunula magna, atra. Alæ posticæ fusco cinereæ. Abdomen cinereum linea laterali, fusca.

This beautiful and chaste form is really an aberration of the type-form *literana*, in which all the black markings are wanting with the exception of the central lunule. The clear green disc

of the superiors, having only this elegant lunule to relieve it, makes ab. *romanana* one of the most beautiful of all the forms of this exquisite species. It is extremely well figured by Hübner, fig. 88. As his book is so rare and costly I have figured an example.

So far as I am aware ab. *romanana* is an extremely rare form in Britain. I have three examples which came from the New Forest. There is also one in the National British Collection, but I do not know of any others.

Ab. *griseana*, n. ab.

I give this name to a form which is exactly similar to the type, but it has the ground-colour of the superiors, which in the type is green, light slate-coloured grey.

I have only seen two examples of this form, both of which are in the collection of Mr. South; the type is labelled "28.8.1914"; both are from the New Forest.

A figure is not given of this aberration, as the point of differentiation from the typical *literana*, L., i.e. the grey ground-colour of the superiors, does not show by the half-tone process.

Ab. *fulroliterana*, n. ab. (Plate I, fig. 4.)

Synonymy.—Hüb., Tort., fig. 91, 1797 (*literana*); Hüb., Verz., p. 386, No. 3750, 1826 (*aerugana*).

The only author who seems to have dealt with this aberration is Hübner, but owing to want of knowledge of what were and what were not species his nomenclature is extremely mixed. In 'Tort.' he figures it (fig. 91), but calls it *literana*; then, subsequently, in 'Verz.', p. 386, No. 3750, he writes—"figs. 92, 91 *aerugana*"; but fig. 92 represents a form quite different from 91. As he, however, in giving the name *aerugana* places 92 before 91, it is obvious that in priority the former must take the name *aerugana* and that the latter is at present without a name, and therefore I have given it the above, and describe it as follows :

As *literana*, L., but with a fulvous longitudinal band on the superiors commencing in the centre of the base and forking immediately after leaving it; one branch dies out on the costal margin about two-thirds of its length from the base, the other branch being carried down the centre of the wing until it almost reaches the hind margin, where it terminates.

This extremely handsome form comes nearest to ab. *tricolorana*, Haw., but is distinguishable at once from it by the clear green ground-colour and the absence of black dots, which are found in that aberration. Hübner's figure admirably portrays it.

It is not very rare in the New Forest, from whence I have a beautiful series of twelve examples.

Unfortunately in the figures the longitudinal fulvous bands show very faintly. The example figured has the black markings very strongly developed. These markings vary in strength in ab. *fulvoliterana* as they do in the type form.

Ab. *fulvomaculana*, n. ab.

I give this name to an aberration which is in all respects similar to the preceding, with the exception that the longitudinal fulvous bands are broken up into blotches, which have portions of the green ground-colour showing between them. It is well figured by Hübner, 'Tort.,' fig. 90 (as *literana*).

I cannot find that any other author has treated of this aberration, which is apparently rare. My series of four examples came from the New Forest.

I have not given a figure of this aberration, the fulvous blotches not showing by the half-tone process.

Ab. *tricolorana*, Haw. (Plate I, fig. 5.)

Synonymy.—*Tricolorana*, Haw., Lep. Brit., p. 411, No. 54 (1803) : Stephens, Cat., p. 188, No. 7096 (1829) ; Curtis, Guide, p. 73 (1829) ; Rennié, Conspect., p. 179 (1832) ; Curtis, Brit. Ent., p. 440, No. 3 (1833) ; Stephens, Haust. iv, p. 165 (1834) ; Godart et Duponchel, Hist. Nat., ix, p. 128, and pl. 242, fig. 2a (*squamana*) (1834) ; Wood, Ind. Ent., fig. 1101 (1839) ; Westwood, Brit. Moths, pl. 96, fig. 13, and p. 164 (1845) ; Staudinger, Cat. Lep. Eur., p. 94 (1861) and p. 234 (1871) ; Snellen, Vlinders, p. 176, No. 7 (*literana* and *tricolorana*) (1882) ; Staudinger, Cat. Pal. Lep., ii, p. 82 (1901) ; Barrett, Brit. Lep., x, p. 216, and pl. 451, fig. 3b (1905) ; Spuler, Schmett. Eur., p. 242 (1908) ; Kennel, Pal. Tort., p. 83 (1908) ; Wagner, Lep. Cat., par. x, p. 69 (1912).

Original description.—*Tortrix tricolorana* (the tri-coloured green) alis cinereo-viridibus, lineolis atomisque atris, striaque furcata ruga. *Tortrix irroranae varietas?* Hüb., Schmett, tab. 15. *Habitat.* Quercetis, at rarissime. *Imago*, f. Sept. *Examplaria per pauca solum vidi.* *Expansio* alarum 9½ lin.

Descriptio. *T. squamanae* nimis affinis, alae antice cinereæ, tinctura viridi, atomis undique parum sparsis nigris. Costa antice, lineolis transversis undulatis, postice, punctis numerosis atrio. Discus literis nebulisque validis itidem atris. Stria rufa extendit—a basi per marginem posticum, et ramulum exserit basin versus, oblique ad medium costæ. Posticæ fuscescentes.

This very beautiful form, as before mentioned, comes near to ab. *fulvoliterana*, but it is distinguished from it by the greyer ground-colour and thick sprinkling of black dots on the superiors. It is not by any means abundant, but can hardly be called rare—at any rate in the New Forest. I should consider it the most abundant of the forms with fulvous markings. I have a fine

series of twenty-one examples, and suppose something like 5 per cent. of one's total catch would be represented by it.

Ab. *suffusana*, ab. n. (Plate I, fig. 10.)

I give this name to a form similar to ab. *tricolorana*, Haw., but with the disc of the superiors more or less suffused with black. I take it this is a modern development tending to an absolutely melanic form. My specimens, seven in number, came from the New Forest.

Ab. *abjectana*, Hüb.

Synonymy.—*Abiectana*, Hüb., Verz., p. 386, No. 3752 (1826); Hüb., Tort., fig. 97 (1797) (*irrorana*); Snellen, Vlinders, p. 176, No. 1 (*irrorana*) (1882); Staudinger, Cat. Pal. Lep., ii, p. 82 (*irrorana*), 1901.

Hübner figures in 'Tort.' figs. 96 and 97 (1797), two totally distinct forms under the name of *irrorana*: 96 is the true *irrorana*. In 1826, in 'Verzeichnis,' he names fig. 97 *abjectana*; according to his figure it is a dull leaden-coloured insect with obscure darker transverse cloudings, a row of black dots in the costa, and another row on the hind margin at the base of the ciliæ.

The only British examples I have seen of this form are three which are in the collection of Mr. R. South; they came from the New Forest.

Ab. *squamana*, Fab.

Synonymy.—*Squamana*, Fab., Syst. Ent., p. 651 (1775); Thunberg, Ins. Suec., par. iv, p. 21 (1784); Fab., Syst. Ent., tome iii, par. ii, p. 270, No. 118 (1794); Donovan, Brit. Ins., v, pl. 157, fig. 7 (1796); Haworth, Lep. Brit., p. 410, No. 52 (1803); Fröl., Tort. Wurt., p. 18 (1828); Curtis, Guide, p. 173 (1829); Stephens, Cat., p. 188, No. 7095 (1829); Rennie, Conspect., p. 179 (1832); Curtis, Brit. Ent., p. 440, No. 2 (1833); Stephens, Haust., iv., p. 165 (1834); Staudinger, Cat. Lep. Eur., p. 234 (1871); Frey., Lep. Schweiz., p. 284 (1880); Sorhagen, Klein. Schmett. Brand., p. 65 (1886); Staudinger, Cat. Pal. Lep., ii, p. 82 (1901); Barrett, Brit. Lep., x, p. 216, and pl. 451, fig. 3 (1905); Spuler, Schmett. Eur., p. 242 (1908); Koenig, Pal. Tort., taf. v, fig. 3; and p. 83 (1908); Wagner, Lep. Cat., par. x, p. 69 (1912).

Original description (*Pyralis squamana*, 'Syst. Ent.', p. 651, No. 36, 1775).—*Pyralis alis vires centibus, seabris. Habitat in Anglia. Mus. Monson. Statura. P. Schallerianae, at paulo longior, aiae antice virides, squamis hinc inde Elevatis seabræ, quæ in medio fere fasciam constituant. Posticæ cinereæ.*

Ab. *squamana* is certainly the most abundant of any of the

literana forms that are found in Britain; in the New Forest at least half of the specimens taken are referable to it.

Ab. *mixtana*, n. ab. (Plate I, fig. 7.)

Synonymy.—Hüb., Tort., fig. 94 (1797); Godart et Duponchel, Hist. Nat., ix, p. 128, and pl. 242, fig. 2b (*squamana*) (1834); Wood., Ind. Ent., fig. 1099 (*squamana*) (1839); Snellen, Vlinders, p. 76, No. 3 (*squamalana*) (1882).

Original description.—I give this name to a form not unlike the last, but instead of the plain green scaly superiors there are mixed with the green colour lighter patches; an extreme form is Hübner's fig. 94; but the majority of the British examples come near to Godart and Duponchel's figure, which is a very close approach to our native specimens.

Ab. *mixtana* is a common form in the New Forest.

(To be continued.)

SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

BY F. C. WOODFORDE, B.A., F.E.S.

(Continued from p. 143.)

Lithophane semibrunnea.—Twenty-one with data. Ten from near Oxford, 4 from Cambridge, 3 from Hants, 4 from Surrey.

L. socia.—Over 30 specimens. One from Cornwall, 8 from Devon, the rest from Hants.

Graptolitha furcifera.—Two from the Spilsbury Collection. Four from the Sellon Collection in perfect condition. One, a rather worn specimen from the Chitty Collection, is labelled "Wales, 1888." Another specimen from the Norgate Collection, presented by Mr. B. H. Crabtree, is labelled "Wales."

Cucullia lychnitis.—Nine specimens with full data. Six from Berks, three from Surrey.

C. asteris.—Six specimens with data from Surrey and Kent.

C. chamomillæ.—A long series with full data.

C. gnaphalii.—Two specimens without data from the Spilsbury Collection.

C. absinthia.—A long series from Devon and Portland.

Anarta cordigera.—Series of 16 with full data, all from Rannoch.

A. melanopa.—Nineteen with full data, also all from Rannoch.

Heliothis dipsacea.—Thirty-one with full data. Twenty from the New Forest taken by myself. Eight from the Champion Collection, "bred, Chobham, Surrey, 1913." Two from the Meldola Collection, "Maldon, Essex." In one of these last the

dark markings of the underwings, instead of being black, are a pale reddish brown.

H. peltigera.—Ten with full data, 7 from Torquay, 1 from the Isle of Wight, 1 from Bridgwater, 1 from the Sellon Collection, labelled "Sydenham, 6 . 88."

H. armigera.—Three with data. One from the Spilsbury Collection, in fine condition, labelled "Babbacombe, J. Terry, Oct., 1871." One from the Meldola Collection, "Torcross, 29 . 8 . 01." The third from the Sellon Collection, "Kent, Strood, 1878."

Thalpochares parra.—One specimen from the Sellon Collection, labelled "Dover, Cummings Collection."

Erastria venustula.—Twenty-eight with full data. Twenty from the Meldola Collection, "St. Leonards Forest, Sussex." Eight from Brentwood, Essex.

Emmelia trabealis.—Long series from Spilsbury, Chitty and Sellon Collections, but unfortunately all without data. One specimen from the Meldola Collection, labelled "Tuddenham."

QUADRIFINÆ.

Plusia chryson.—Twelve with data. One from Swansea, bred and presented by Mr. W. Holland; the rest from Cambridge.

P. bractea.—Two with data, "Kincardineshire, 1916," presented by Mr. Horne. A fine series of 8 from the Hope and Spilsbury Collections without data.

P. ni.—One specimen from the Meldola Collection, bred in 1906 from ova deposited by a ♀ caught near Tenby by Mr. J. A. Finzi, recorded in 'Entom.', 1906, p. 212.

P. interrogationis.—Twenty-three with data. Six labelled "Keswick, 1896," the rest from various Scotch localities.

Catocala fraxini.—Four specimens. One from the Hope Collection, much worn and damaged, labelled "Wells' British Collection." One from the Spilsbury Collection, labelled "Whitby." A second from the Spilsbury Collection in good condition is without data. One bred, 1910, by Dr. R. Whitehouse, who presented it to the Collection, from an ovum deposited by a female captured at Horsham, 16 . 7 . 09, by A. James, of Tootham.

C. nuptia.—In the long series is one remarkable specimen from the Champion Collection. The usual red bands of the hind wing are of a very dark maroon-brown colour (ab. *brunnescens*, Warren). It was taken on a lamp in Guildford, September 2nd, 1907.

Torocampa cracca.—Twenty-eight with full data. Twenty-six of these are from N. Cornwall. Two, from the Meldola Collection, are labelled "N. Devon."

HYPENINE.

Laspeyria flexula.—Twenty-eight with full data from Dorset, Hants, Oxford, Surrey and Essex.

Parascotia fuliginaria.—Two from the Spilsbury Collection without data.

Zanclognatha emortualis.—One specimen from the Spilsbury Collection, labelled "Loughton, 1870."

Madopa salicalis.—Five specimens, all without data. One from the Hope Collection, two from the Spilsbury, two from the Sellon. The last two have not been reset, and are set very low on very old twist-headed pins.

Herminia cibrinalis.—Twenty-four specimens. Four from the Meldola Collection, labelled "Wicken Fen."

H. derivalis.—Ten specimens with data. Nine from Colchester, one from Abbots Wood.

Hyphenodes tænialis and *costæstrigalis*.—A fair series of each species with full data. The same may be said of *Tholomiges turfosalis*.

A BLOOD SUCKING THRIPS.

By C. B. WILLIAMS, M.A., F.E.S.

SOME apology is needed for the notes below, as the insect to which they relate is unidentified, and the solitary specimen obtained has been lost apparently beyond hope of recovery. In view, however, of the fact that a blood-sucking habit is quite unrecorded among the Thysanoptera, it was thought as well to publish the notes in their present incomplete state rather than wait an unknown length of time until the discovery of another specimen of the thrips.

On May 13th, 1918, in the Island of Trinidad, British West Indies, Mr. F. W. Urich, Entomologist to the Board of Agriculture, gave me a thrips alive in a tube with the information that it had settled on his wrist the previous afternoon, waved its abdomen from side to side and sucked his blood for about five minutes, causing a hot pain similar to that caused by sand-flies (*Psychodidae*), and leaving three small red punctures.

I placed the tube containing the thrips mouth downward over my wrist and obtained immediate confirmation of Mr. Urich's interesting observation. After walking for less than half an inch on my wrist the thrips selected a suitable spot and then pierced the skin with its mouth-parts, causing an immediate hot burning sensation. It remained sucking in the same spot for over half an hour, causing a sudden sharp pain about once every minute.

Even after half an hour it only stopped because I accidentally disturbed it. Its body was then distended and pale reddish in colour owing to the blood contained in it.

It raised on my wrist a small white lump about twice the size of the thrips in diameter surrounded by an irregular blotched area about $\frac{3}{4}$ in. by $\frac{1}{2}$ in. in size.

An hour after the red blotched area had gone but the smaller white raised area was still visible; after two hours only a small red mark at the point of the bite was visible.

The specimen was mounted but has been lost. It was of the family Phloeothripidae, of the sub-order Tubulifera, of medium size (2 or 3 mm.), and from a rough examination I had believed it to belong somewhere near the genus *Trichothrips*.

Trinidad:
January, 1921.

THE HETEROPTERA OF INDO-CHINA.

By W. L. DISTANT.

This communication is in continuation of some which have already appeared in the 'Entomologist' (vols. li, lii and liii), and are fragmentary according to material received.

The specimens have been sent by Mon. R. Vitalis de Salvaza, who hopes at some interval to produce a large work on the insect fauna of this interesting region.

Fam. PENTATOMIDÆ.

Sub-Fam. TESSERATOMINÆ.

<i>Neosalica nigrovittata</i> , sp. n.	<i>Eurostus heros</i> , Bredd.
<i>Tesseratoma nigroscutellata</i> , sp. n.	<i>Mattiphus jaspideus</i> , H. S.
" <i>quadrata</i> , Dist.	" <i>splendidus</i> , sp. n.
" <i>javanica</i> , Thunb.	<i>Xiengia elongata</i> , gen. n., sp. n.
<i>Vitruvius insignis</i> , Dist.	<i>Asiarcha nigridorsis</i> , Stål.
<i>Eusthenes robustus</i> , Lep. & Serv.	<i>Carpone amplicollis</i> , Stål.
" <i>humeralis</i> , sp. n.	" <i>angulata</i> , Stål.
" <i>sævus</i> , Stål.	<i>Pycanum ochraceum</i> , Stål.
" <i>rubefactus</i> , Dist.	" <i>ponerostom</i> , Stål.
" <i>scutellaris</i> , H. S.	<i>Dalcantha alata</i> , Bredd.

NEOSALICA.

Neosalica, Dist., 'Ent. Month. Mag.', xix, p. 157 (1882).
Mesolea, Bredd., 'Wien Ent. Zeit.', xxi, p. 99 (1902).

Neosalica nigrovittata, sp. n.

Dull dark ochraceous, membrane shining cupreus; antennæ, lateral margins of pronotum and the lateral pronotal angles, two central longitudinal fasciae not reaching anterior margin and a transverse line before anterior margin, three spots at base of scutellum, about two-thirds of the lateral margins, and the apical

margin of same, lateral margins of sternum, bases of coxae, abdominal spiracles and upper and inner margins of outer areas to abdominal segments, black; connexivum ochraceous with black spots at the union of the segments; legs piceous; rostrum ochraceous, slightly passing the anterior coxae; antennae with the first and third joints shortest and subequal in length, second and fourth longest, fifth shorter than fourth; upper surface more or less transversely wrinkled and finely thickly punctate; scutellum centrally longitudinally ridged, the posterior segmental lateral angles shortly spinous.

Long, 22–29 mm.

Tonkin.

Tesseratoma nigroscutellata, sp. n.

Head and antennae black; pronotum dark ochraceous or very pale castaneous, anterior and anterior lateral areas black; scutellum dark ochraceous on basal area, remaining area and apex black; corium dark, sometimes pale ochraceous, membrane very pale ochraceous; body beneath, rostrum and legs piceous; body beneath sometimes almost completely covered with greyish-white suffusion; wings ochraceous, widely margined with fuscous-brown; antennae stout, third joint slightly shorter than second or fourth; head above moderately concave; body above thickly somewhat finely punctate; pronotum with the margins moderately subquadrate, at anterior angles distinctly compressed; scutellum on the apical black area coarsely punctate, the apex broadly, centrally, longitudinally sulcate; sternum considerably elevated centrally, and most prominently near the anterior coxae.

Long, 27–32 mm.; breadth at pronotal angles, 14–17 mm.

Tonkin; Haut Mekong.

Eusthenes humeralis, sp. n.

Head, pronotum and scutellum more or less olivaceous, corium castaneous-brown; membrane shining castaneous; sternum shining virescent; head beneath, basal joint of antennae, rostrum, coxae, trochanters, legs and metasternal elevation more or less brownish or brownish-ochraceous; antennae fuscous, with the second and fourth joints longest; pronotum with the lateral angles broadly prominent, the lateral angles and margins more or less subrugosely punctate; scutellum with about basal half strongly transversely rugose, the apex concave; corium very thickly and very finely punctate; connexivum above dark olivaceous, with the base of each segment ochraceously maculate; posterior femora very robust, with a long curved spine beneath before middle, and with shorter and more obsolete spines near apex.

Long, 30 mm.; breadth between pronotal angles, 17 mm.

Tonkin.

Eusthenes rubefactus.

Eusthenes rubefactus, Dist., 'Trans. Ent. Soc. Lond.', 1901, p. 111; id., 'Faun. B. Ind. Rhynch.', i, p. 267 (1902).

Eusthenes diomedes, Bredd., 'Wien Ent. Zeit.', xxiii, p. 15 (1904).
Tonkin, Burma.

Mattiphus splendidus, sp. n.

Head, pronotum and scutellum resplendent green, corium pale castaneous with greenish reflexions, membrane very pale castaneous; body beneath resplendent-green or golden-green; head beneath, rostrum and legs pale castaneous; antennæ castaneous, becoming darker towards apex, second joint longest, third a little shorter than fourth; pronotum and scutellum more or less finely transversely wrinkled; corium thickly but very finely punctate.

Long, 23-25 mm.; breadth between pronotal angles, 11-12 mm.

Haut-Mékong.

Allied to *M. jaspidens*, H. Sch., but with the lateral margins of the pronotum more uniformly rounded.

 XIENGIA, gen. nov.

Body elongate, about twice as long as breadth between pronotal angles, distinctly narrowing towards apex; head about as long an breadth between eyes, obliquely depressed, somewhat convex on basal area between eyes; ocelli placed close to eyes; rostrum reaching or very slightly passing the anterior coxae; antennæ with the basal joint moderately thickened, second joint considerably longer than first; pronotum laterally and angularly dilated, the lateral angles broad, but apically finely and spinosely transversely produced, anterior pronotal area acutely depressed; scutellum much longer than broad at base, a little before apex somewhat suddenly narrowed, the base slightly convex; mesosternum centrally ridged or keeled; tibiæ moderately compressed or sulcate on apical halves.

I have placed this genus near *Origanus*, Dist.

 · Xiengia elongata, sp. n.

Ochraceous; eyes and a prominent apical spot to scutellum, black; head and anterior area of pronotum paler in hue than the basal pronotal area; membrane paler and brighter in hue; body beneath and legs ochraceous; antennæ ochraceous, apex of second joint black (remaining joints mutilated); anterior area of head and anterior and lateral pronotal margins more or less speckled with black, the anterior lateral margins serrate, the posterior area darker in hue and somewhat thickly and strongly rugulose, the lateral angles transversely, spinously produced; scutellum rugulose and punctate; body beneath and legs ochraceous; rostrum robust, just passing the anterior coxae, finely, centrally, longitudinally channelled beneath.

Long, 33 mm.; breadth between anterior pronotal angles, 17½ mm.
Xieng Khouang.

Subfam. DINIDORINÆ.

<i>Cyclopelta abdominalis</i> , Dist.	<i>Aspongopus brunneus</i> , Thunb.
" <i>rugosa</i> , sp. n.	" <i>laosanus</i> , sp. n.
" <i>obscura</i> , Lepell. and Serv.	<i>Megymenum brevicorne</i> , Fabr.
<i>Aspongopus fuscus</i> , Westw.	" <i>mekongum</i> , sp. n.
" <i>nigriventris</i> , Westw.	" <i>parallelum</i> , Voll.
" <i>chinensis</i> , Dall.	" <i>spinosum</i> , Burm.

Cyclopelta rugosa, sp. n.

Dark bronzy-brown; head, anterior half of pronotum, about apical half of scutellum, and the corium more or less olivaceous-green; body beneath and legs more or less castaneous, the tibiæ, spiracles, and extreme lateral margin to abdomen distinctly darker in hue; antennæ black, second joint longest and moderately compressed, third joint short, fourth less compressed, longer than third, shorter than second; pronotum finely punctate and transversely rugulose, with a more or less distinct, central, longitudinal carinate line; scutellum more or less transversely rugose, on basal and apical areas more obliquely rugose; corium more or less irregularly rugulose; rostrum about reaching the intermediate coxæ; anterior femora distinctly spined beneath on apical area.

Long, 12 mm.

Xieng Khouang.

The apex of the scutellum is more rounded and less angulate than in *C. parva*, Dist., or *C. abdominalis*, Dist.

Aspongopus laosanus, sp. n.

Black; lateral margins of pronotum, about basal half of lateral margins of corium, connexivum and lateral margins of sternum and abdomen beneath, sanguineous. Antennæ robust, five-jointed, fourth and fifth joints longest, subequal in length, second and third joints short and also subequal in length, first joint shortly passing apex of head, second, third and fourth joints obscurely sulcate; body above very finely, thickly and somewhat obscurely punctate; scutellum somewhat obscurely, transversely rugose; membrane slightly passing the abdominal apex; rostrum not quite reaching the intermediate coxæ, its base dull reddish; body beneath thickly finely punctate.

Long, 15–16 mm.

Haut Mékong; Laos, Xieng Khouang.

Allied *A. marginatus*, Costa.

Megymenum mekongum, sp. n.

Dull dark blackish-brown; membrane dull ochraceous, the venation darker and subprominent; head above with the lobes broadly, concavely excavate, their apices distinctly cleft; antennæ robust, not nearly reaching apex of head, second joint longest, third and fourth subequal in length, fourth slender, ochraceous, blackish-brown at base; pronotum rugose, with a short curved spine on each side behind eyes, the anterior lateral areas thickly rugose, roundly and a little upwardly produced, near their bases a short obtuse spine on the lateral margins, behind head with a distinct circular concave protuberance, and with a distinct central excavate central line on posterior area; scutellum about as long as breadth at base, more or less transversely rugose, and with a distinct central, longitudinal raised line; membrane not reaching abdominal apex, the veins prominent; rostrum reaching the intermediate coxæ; abdomen

beneath with a more or less obscure metallic lustre; posterior lateral margins of the segments concavely produced.

Long, 17 mm.; breadth between pronotal angles, 8 mm.

Luang Prabang, Muong Yon; Haut Mekong, Vien Ponkha.

Allied to *M. parallelum*, Voll.

Subfam. PHYLLOCEPHALINÆ.

<i>Cressona valida</i> , Dall.	<i>Diplorhinus coloratus</i> , sp. n.
<i>Chalcopis glandulosa</i> , Wolff.	<i>Tetroda histeroides</i> , Fabr.
<i>Metonymia scabrata</i> , Dist.	„ <i>denticulifera</i> , Bergr.
<i>Salrianus vitalisanus</i> , sp. n.	„ <i>latula</i> , sp. n.
„ <i>dilatata</i> , Dist.	<i>Megarhynchus rostratus</i> , Fabr.
<i>Gonopsis coccinea</i> , Walk.	„ <i>truncatus</i> , Westw.
„ <i>toukinensis</i> , Breda.	„ <i>limatus</i> , H. Sch.
„ <i>salvazana</i> , sp. n.	

Salrianus vitalisanus, sp. n.

Castaneous-brown; head, anterior area of pronotum and the scutellum dull dark ochraceous; membrane greyish; antennæ ochraceous, apical joint, excluding extreme base, black, second and fourth joints equal in length, third shortest, fifth longest; anterior area of pronotum with two transverse darker fasciate lines, the lateral angles somewhat forwardly produced, their apices black, posterior pronotal area, corium and the scutellum more or less rugosely punctate; membranal veins more or less ochraceous; body beneath and legs paler and more ochraceous in hue; rostrum ochraceous, its extreme apex black and reaching the anterior coxae; prosternum paler in hue and coarsely punctate.

Long, 16–18 mm.; breadth between pronotal angles, 12–15 mm.

Tonkin, Chaya; Laos, Xieng Khouang.

Gonopsis salvazana, sp. n.

Head, pronotum, scutellum and corium dull ochraceous, darkly punctate, the punctures black on head, anterior half of pronotum and the corium, a short transverse series of small spots on anterior pronotal area behind head, the margin of pronotal lateral angles and two small contiguous spots on apical area of scutellum, black; membrane pale bronzy-brown, the veins prominent and a little darker in hue; antennæ reddish-ochraceous, first and third joints subequal in length, each much shorter than second, remaining joints immitated; head, pronotum and corium, finely, somewhat thickly blackly punctate, scutellum more rugosely punctate; body beneath thickly, somewhat coarsely, darkly punctate.

Long, ♀ 16 mm.; breadth between pronotal angles, 9½ mm.

Thadna.

Diplorhinus coloratus, sp. n.

Head and pronotum sanguineous, the apices of the lobes of the first and a broad transverse fascia between and including the pronotal lateral spines, black; scutellum black, its base sanguineous; corium ochraceous, sanguineous at base and black on lateral marginal

areas, membrane ochraceous; connexivum black; body beneath sanguineous; legs black; antennæ fuscous, second joint longer than either third or fourth, fifth joint longest; body above thickly, coarsely punctate, base of scutellum transversely wrinkled; rostrum about or only just reaching anterior coxae; mesosternum centrally carinate; head about as long as pronotum, the lateral lobes prolonged, widely separated, their apices acuminate; lateral pronotal angles acuminate and concavely forwardly produced.

Long, 17–20 mm.

Tonkin.

It is probable that this beautiful species may be entitled to generic consideration.

Tetroda denticulifera, Bergr., 'Ann. Nat. Hist.', xv, p. 488 (1915). Tonkin.

If I have correctly identified Bergroth's species, it is much more closely allied to *T. histerodes*, Fabr., than to *T. obtusa*, Dall.

Tetroda latula, sp. n.

Dark brownish-ochraceous: two small transverse spots near middle of anterior margin of pronotum, black; scutellum with a small ochraceous spot more or less margined with black in each basal angle; lateral lobes of the head broad, well separated, their apices rounded and their upper surfaces moderately concave; pronotum distinctly transversely ridged near basal area, the anterior lateral angles subacutely and a little upwardly produced; scutellum rugosely punctate, apex somewhat broad and angularly rounded; corium finely punctate, with a pale longitudinal submarginal fascia; body beneath and legs brownish-ochraceous; antennæ mutilated.

Long, 12 mm.

Laos; Pak Vet, Nam Khane R.

SOUTH AMERICAN EUMOLPIDÆ, MOSTLY OF THE GROUP COLASPINI.

BY FRED. C. BOWDITCH.

(Continued from p. 76.)

Colaspis tucumanensis, sp. nov.

Medium sized. Testaceous brown, body beneath, head above and extreme margins of the thorax and elytra metallic green, thorax very densely and evenly punctate; elytra regularly geminate punctate, becoming single at apex; intervals regularly elevate costate, basal depression nearly obsolete; hind tibia of ♂ slightly dilated within, at the posterior half.

Types, Argentina, Prov. Tucuman, two ♂, two ♀.

Length, 6 mm.

Head densely punctured with the usual smooth calli, shining; thorax with sides feebly undulate angulate at the middle; scutellum

smooth, shining. The general effect of the dense punctuation is to give the species an opaque appearance; it is very close to *gemellata*, Lef., from Bolivia, but that form has the hind tibia of the ♂ simple, and the punctures are green. The punctures of the elytra are really a close series of foveæ, arranged in pairs and often confluent.

Colaspis riridicollis, sp. nov.

Smaller than *trivialis*, Boh. Body below chestnut brown; head shining brown, tinged with green; thorax very thickly finely punctured, brown, strongly shining greenish, the extreme edges and also the outside edges of the elytra metallic green; elytra brown, strongly greenish iridescent, costate in the ♀, at the apex only ♂.

Types, five ♂, two ♀, Paramba (3500 ft., April, 1897, dry season, Rosenberg).

Length, 4-5 mm.

Head with strong transverse depression between the eyes, vertex tumid; antennæ with joints 7 and 11 darker, thorax strongly bidentate at the sides; the punctuation as usual a little heavier at the sides. Elytra strongly transversely depressed, and also within the shoulder, so that the sutural area is prominently raised (like *Compta*); punctation fine, fairly regular geminate, the intervals defined, but not raised in the ♂ except at the apex, regularly costate almost from base to apex in ♀, body a little more attenuate in the ♂ than ♀; sometimes the legs are infuscate at the knee and apex of tibia and tarsi. The species goes near *submetallica*, Jae.

Colaspis boliviensis, sp. nov.

Small, like *inconstans*, Lef. Above, bronzed, shining, with more or less greenish tint, lateral and basal thoracic, as well as edges of elytra very narrowly metallic green, bottom of punctures greenish; body below metallic greenish, bronze, the colours predominating according to the angle of vision; legs flavous, thighs tinged with aeneous.

Types, four ♂, six ♀, Cochabamba, Boliv. (Germ.).

Length, 3·5-4 mm.

Head finely and evenly punctured, with both transverse and longitudinal depressions; antennæ dark rufous, fuscous at tip; thorax thickly, evenly and strongly punctate, bidentate at the sides (the anterior rather obsolete), transversely depressed before the middle (semi-collared); elytra transversely depressed, with raised scutellar area (like *Compta*); punctures not as strong as thorax, except laterally; lineate next the suture, semi-geminate on the disc, larger, confused, and somewhat confluent laterally, forming transverse rugæ, obsoletely subcostate at apex. Nearly related to *manca*, Er., but much smaller, and without the pronounced metallic greenish or violet colour of that form, which

occurs in numbers from the same locality. The last ventral segment of the ♀'s of both species is strongly serrate.

Colaspis impressipennis, sp. nov.

Medium sized. Below purple black, with sides of thorax and breast more or less metallic; above, dark cyaneous blue, with edges in certain lights picked out very narrowly with cyaneous; antennæ brown (scape tinged with metallic), darker towards the tip; legs purplish black, apex of tibiae and tarsi fuscous rufous; elytra with transverse basal depression across the elytra.

Type, ♀, Cachabé, low c., January, 1897 (Rosenberg).

Length, 4 mm.

Head transversely depressed and moderately thickly punctate, thorax rather sparsely punctate; coarse and confluent at the sides, which are strongly angulate at the middle and nearly straight at the base (like *cupreovittata*, Lef.); all the angles very marked; scutellum smooth. Elytral punctures rather coarse at the base and sides, confluent at the latter, fairly regularly punctate striate on disc and behind. Size and shape of *gemmula*, Er., but that form has light legs and strongly rugose upper surface.

Colaspis jocosa, sp. nov.

Small, oblong. Below black, sides of prothorax and breast green; above brilliant metallic green; antennæ and legs black; the base of the former and tarsi of the latter semi-rufescent; femora semi-aeneous; thorax strongly and rather evenly but not thickly punctate; sides strongly angulate at middle.

Type, two ♀, Rio Juntos, Boliv., green label (Callanga), Peru.

Length, 3-3·5 mm.

Head coarsely punctate, with smooth frontal calli; the usual cross depression poorly defined; thorax strongly transverse, faintly depressed each side of the middle. Elytra with strong humeral and transverse depressions, throwing up the scutellar area as in *Compta*, Lef.; finely geminate punctate striate on disc, coarser at the base and sides, and fine and regularly striate at apex. Very like *pumilio*, Lef., but much larger, and without the cyaneous colour of that species.

Colaspis aeneicollis, sp. nov.

Very small. Head, thorax and scutell bright aeneous bronze; elytra bright chestnut rufous, with the sides below the shoulder and suture somewhat suffused bronzy; body below and legs opaque rufous, with inflexed sides of thorax bronzed; antennæ rufous, darkened at tip.

Type, ♀, Salinas, Beni R., July, 1895 (Stuart).

Length, 2·5 mm.

Head, with both transverse and longitudinal depressions, finely punctate; thorax finely punctate, sparsely on the disc and rear, crowded and larger on the sides, which are strongly angulate behind the middle and obsoletely sinuate before the angle. Elytra rather obsoletely transversely depressed and showing a scarcely raised scutellar area; finely lineate punctate. From the humerus to the apex the intervals are raised and roughened, so that the outer half of each elytra, especially the shoulders, is covered with raised rugosities; the apex is lineate costate. Nearly allied to *Pusilla*, Lef., but smaller and differently coloured than any of the numerous small forms. I infer from the looks of my examples in certain lights that some would be entirely bronze above, with rufous shoulders.

(To be continued.)

NOTES AND OBSERVATIONS.

THE EMERGENCE OF *PIERIS RAPÆ*.—For some years past I have been experimenting on the pigmentation of this butterfly, and last season, with a view to carrying on my work, I obtained a few ova from the spring brood, *metra*. I was unfortunate with the larvæ, as all died off except two which duly pupated towards the middle or end of June. However, they did not emerge at the commencement of August, and finally I took the boxes containing the two pupæ into a cold room indoors. To my surprise one of the butterflies emerged on November 11th—a day or two after a fire had been lit in the room for the purpose of airing it. I promptly took the other pupa out-of-doors again, and finally obtained a male imago from it on May 13th. The insect is rather small, its markings are pale, the blotches on the fore wings almost obsolete, and it would probably pass for *metra* anywhere. I think these two emergences open up the interesting question as to whether pupæ from the spring (*metra*) brood do not occasionally stand over till the following year, and emerge in the spring as *metra*, instead of in early August as *rapæ*. In other words, are individuals of this and possibly the other Pierides occasionally single brooded? I may add that the insect which I obtained in November was a fine female, dark cream in colour, the colour resembling in tone that of the primrose, without that flower's greenish tinge. I find that as a rule I obtain deep cream or yellow pigmentation in about half the insects I experiment with.—HAROLD D. FORD; Thursby Vicarage, Carlisle.

BRENTHIS EUPHROSYNE, AB. — I had the good fortune to capture a specimen of *B. euphrosyne* on Sunday last in which the orange ground was uniformly replaced on the upper side by the palest cream. It is almost white. The black markings are slightly heavier than usual. The insect is in first-class condition.—E. H. SILLS; Sibylla, Bray's Lane, Coventry.

ACRONYCTA ALNI, AB. STEINERTI.—A larva of *Acronycta alni* taken by me on poplar in a garden here on September 16th, 1920, produced the moth on May 10th this year. It proves to be a very fine and large specimen of the melanic var. *steinerti*, Caspari.—G. H. E. HOPKINS; Shevington Vicarage, near Wigan, Lancs.

OPORABIA AUTUMNATA AND AMPHISA PRODROMANA IN GLAMORGAN.—Of a long series of *Oporobia* taken in the neighbourhood of Merthyr Tydfil and sent to Mr. F. N. Pierce for examination in connection with the Faunistic Survey of Glamorgan, over 80 per cent. have been found to be *O. autumnata*. Its occurrence in this district was also suspected by Mr. R. South from specimens of *Oporobia* sent to him in 1910. Among a number of "Micros" also sent to Mr. Pierce through the National Museum of Wales a specimen of *Amphisa prodromana* has been identified. This was taken among *Vaccinium myrtillus* on the hills near Merthyr Tydfil. As I understand each of these species is regarded as a northern insect, it would be interesting to know whether either of them has been previously observed so far south.—G. FLEMING; 26, West Grove, Merthyr Tydfil.

OXIGRAPHA LITERANA IN NORTH OF IRELAND.—Mr. W. G. Sheldon, F.E.S., in his most interesting paper on the above species, states that in Ireland it is only recorded from the counties of Kerry and Cork. May I point out that it is found in several woods in this district (East Tyrone), but not commonly; I have observed it as early as the middle of March (hibernated). Its occurrence in this locality is on a par with that of several other species of Lepidoptera believed to be confined to the south and practically absent in Ulster, such as *Vanessa io* (now abundant), *Agrotis corticella*, *Amphipyra pyramidea* and *Pachys strataria*. No doubt it exists in many Irish counties wherever there is any extent of woodlands.—THOMAS GREER; Stewartstown, Co. Tyrone.

OXIGRAPHA LITERANA IN NORTHUMBERLAND.—In conjunction with Mr. W. G. Sheldon's notes on the distribution of this species in Britain (p. 133, *antea*), in his most interesting paper in the 'Entomologist' for this month, it may be desirable to record that I took it at Kyloe in North Northumberland in 1894. I believe I also found it at Chillingham, in the same district, about the same date, but the note of that must have got mislaid.—GEORGE BOLAM; Alston.

EARLY BUTTERFLIES IN 1921.—The following list of butterflies taken or seen on May 1st in South Bucks perhaps helps to illustrate the general forwardness of insects in the spring: *Pieris brassicae*, *P. napi*, *P. rapae*, all abundant. The latter was fairly plentiful as early as April 2nd. *Euchloë cardamines*, males common, females scarce. *Gonepteryx rhamni*, *Aglais urticae*, *Vanessa io*, the usual hibernated specimens seen. *Brenthis euphrosyne*, just emerging in one sheltered gully in a wood; a short series obtained. *Pararge egeria*, var. *egerides*, abundant in all woods visited; females very large, first seen on April 12th. *P. megæra*, *Callophrys rubi*, one or two obtained. *Nisoniades tages*, fairly well out in one locality. I

expected to find *Celastrina argiolus*, but saw nothing of it.—S. B. HODGSON, 3, Bassett Road, North Kensington, London, W.

PYRAUSTA PURPURALIS IN APRIL.—To add to the long list of early records for 1921 that have been appearing in the 'Entomologist,' it may be of interest to record that I found this species on the wing in Gilderdale Forest, Northumberland, on April 27th last—a most unusual date. Its usual time of appearance here, when it is often abundant, is about the end of June and throughout July.—GEORGE BOLAM, Alston

EMUS HIRTUS IN DORSET.—I took a nice specimen of this scarce beetle, *Emus hirtus*, L., on almost fresh cow-dung on May 31st, while walking over Arne Heath, near Poole Harbour. The day was dullish and not too warm.—F. H. HAINES; Brookside, Winfrith, Dorset.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—February 24th.—The President in the Chair.—Mr. W. H. Bristowe, Ashford House, Cobham, Surrey, and Mr. Hy. Ruggles, 146, Southfield Road, Bedford Park, W. 4, were elected members. Lantern-slides were exhibited as follows: Mr. Dennis, details of the structure of an Oribatid mite; Mr. Bennett, of the fish parasite *Argulus*, species of *Protura*, and the rasp of the field-cricket.—Mr. Leeds exhibited a very long series of the undersides of the male of *Polyommatus icarus* each identified as a named form from Tutt's 'British Lepidoptera.'—Mr. Hy. J. Turner, a bred series of *Morpho luerles* with a coloured photograph of the larva, and three *Thysania agrippina*, one measuring 11 in. in expanso, both species sent from Sao Paulo by Mr. Lindeman.—Mr. Hy. Moore, the Hemipteron *Plataspis vermicellaris* from Nairobi.—Mr. Buckstone, specimens of the water-beetle *Helophorus aquaticus*, taken flying in the sunshine in abundance a few feet from the ground.

March 10th.—The President in the Chair.—Mr. J. Bates, Hornsey, and Major T. M. Cottam, Twickenham, were elected members.—A special exhibition of the genus *Zygæna*.—Mr. Hy. J. Turner, many species representing the different sections of the genus in the Palaearctic Region from the British Isles to Japan and from Siberia to the Himalayas.—Mr. G. Talbot, for J. J. Joicey, Esq., showing the variation in *Z. ephialtes*, *Z. fraxini*, *Z. carniolica* and *Z. transalpina*; and extreme confluent black and yellow forms of *Z. trifolii* and *Z. filipendulae* (British), with a specimen of the last with five wings.—Mr. A. W. Mera, British species including a supposed six-spotted form of *Z. trifolii*.—Mr. B. W. Adkin, British species, including *Z. filipendulae* with the sixth spot more or less evanescent.—Mr. Leeds, numerous aberrations of the British species.—Mr. Tonge, British species, including *Z. filipendulae* with very inconspicuously marked sixth spot and very broad hind margin of hind wing in an Eastbourne example.—Mr. Jarrett, *Z. hippocrepidis* from

North Wales and a yellow *Z. filipendulae*.—Mr. T. H. Grosvenor, British species in long series, and read notes on the variations and the rearing.—Mr. A. W. Buckstone, very long series of British species showing racial characters and some hybrids.—Mr. Barnett, series of British species.—Mr. B. S. Williams, asymmetrical *Vanessa io*, *Polyommatus icarus* aberration in which the *parvipuncta*, *discreta* and *icarinus* forms were united, and a brown suffused underside of the male of the latter species.

March 24th, 1921.—Mr. K. G. Blair, B.Sc., F.E.S., President, in the Chair.—Mr. L. W. Newman exhibited the two forms, all green and green and red, larvæ of *Rumicia phœas* from Bexley, and reported *Tripæna pronuba* at sallow.—Mr. Main, the "cellar-beetle," *Blaps mucronata*.—Mr. Edwards, numerous species of *Gnophos* from Central Europe.—Mr. B. S. Williams, aberrations of *Cænonymphia pamphilus* from Scotland and Swanage.—Major Cottam, *Phryxus livornica* from Southbourne, a melanic *Mimas tiliae*, and ab. *costovata* of *Xanthorhoë fluctuata*.—Mr. Priske read an extract showing the usual newspaper ignorance of scientific facts.—Mr. Grosvenor reported *Pieris rapæ* on March 20th, and that *Zygæna trifolii* larvæ had stirred from hibernation.—Mr. Turner, specimens of the *hibernica* race of *Euchloë cardamines*, including a form of *caulosticta* with large discal spot extended along the costa, and the forms *dilatata* and *erxia* with the type form of the South African Pierid *Eronia cleodora*. The abundance of the larvæ of *Abraxas grossulariata* was remarked on and *Pachys strataria* (*prodromaria*) was reported from Finchley.—*Hy. J. TURNER, Hon. Editor of Proceedings.*

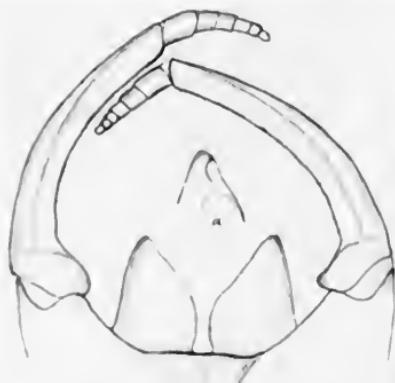
LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, March 21st, 1921, Mr. Leonard West in the Chair.—Mr. H. M. Hallett, a Vice-President of the Society, sent a paper entitled "Parasitic Wasps and Bees." The author gave a review of practically all that is known of the parasitism of the Hymenoptera, but such a vast subject could not adequately be dealt with in a short paper. Sketches of the life-histories of the parasitic Ichneumonidæ, Chalcididæ, Proctotrypidæ, Chrysididæ and Aculeates were given, difficulties of observation were touched upon and suggestions for future work advanced for the guidance of students of these interesting families.—Mr. Chas. P. Rimmer exhibited a long series of *Cerastis vaccinii* to show the variation of this moth as met with at Delamere Forest. Mr. W. Mansbridge showed *Selenia tetralunaria* which had emerged in a warm room during February.

April 18th, 1921.—This meeting was held at the Liverpool School of Tropical Medicine, Mr. J. W. Griffin, Vice-President, in the Chair.—The members and visitors were received by Prof. Robert Newstead, M.Sc., F.R.S., and the staff of the Entomological Department.—Miss Jessie L. M. Bird, 4, Riverside Road, Aigburth, Liverpool, and Mr. Herbert Leigh-Lye, Holly Lea, Greenbank Road, Liverpool, were elected members of the Society.—Prof. Newstead gave a brief sketch of the work of the Entomological Department since the last visit of the Society. Investigations bearing on questions of public health

had been carried out on behalf of the Ministry of Health, the Port Sanitary Authority and the Public Health Department of the City of Liverpool. At the request of the Canadian Government Prof. Newstead had undertaken an examination of the cargoes of grain ships arriving in this port from Canada, for the presence of infestation by the flour mite, *Aleurobius farinosæ*, which in suitable conditions does immense damage to flour. During the year a very large amount of systematic work had been done. A remarkable new giant scale insect had recently been described by Prof. Newstead as *Aspidoproctus africana* from Tanganyika Territory. A very large collection of sand-flies (*Phlebotomus*), of which genus at least one species is known to be the carrier of sand-fly fever, had been made by Major A. J. Sinton, V.C., in the North-West Frontier Province of India, and brought to Prof. Newstead to be dealt with; some highly interesting facts regarding the distribution of some of the species were mentioned. A very large and important piece of systematic work had been carried out by Mr. H. F. Carter and Drs. A. Ingram and J. W. Scott Macfie on the blood-sucking midges (*Ceratopogoninae*) of the Gold Coast. A great many new species, representing several different genera, and also a new genus of this family had been described, many being in both the larval and pupal as well as the perfect stage. In most cases important facts as to the breeding-places and bionomics of the different species were recorded. This work is still far from complete, but when finished it will constitute a most important contribution to the literature of this family of tiny but exasperating insects. A new species of Tse-tse fly, *Glossina schwetzi*, had just been described by Prof. Newstead and Miss A. M. Evans. The material had been collected by Dr. J. Schwetz of the Sleeping Sickness Mission of the Belgian Congo, and to him the new fly was dedicated. *Glossina schwetzi* belongs to the group of large Tse-tse flies known as the *fusca* group, the species of which cannot be separated by external characters alone. The Society inspected the Museum, which was not completed on the occasion of their last visit to the School in April, 1920. In the Entomological Section of the Museum was exhibited material connected with the work that the Professor referred to in his short address. The collections of biting flies were on view as well as a number of cases of tropical Coleoptera, Hymenoptera, Neuroptera, etc., of general interest. There were also some living examples of the larvae of the rot hole breeding mosquitoes, *Anopheles plumbeus* and *Ochlerotatus geniculatus* from the district round Liverpool; also adults of *Culex pipiens* and *Anopheles bifurcatus*. The members of the Entomological Staff were highly gratified at the very keen interest that their visitors showed in the various exhibits and they well deserved the cordial thanks of the Society. During the evening it was announced that Prof. Newstead's chief assistant, Mr. H. F. Carter, had been appointed Malariaologist to the Government of Ceylon; accordingly a resolution congratulating Mr. Carter upon having been chosen for such an important appointment was carried unanimously.—WM. MANSBRIDGE, Hon. Sec.



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Palingenia mesopotamica

*Ph. E. R. M. Addis,
M. F. M. Kelly*

K. J. M. del.

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A NEW SPECIES OF MAYFLY, *PALINGENIA* (*SENSU LATO*), FROM MESOPOTAMIA.

By KENNETH J. MORTON, F.E.S.

(Plate II.)

ALTHOUGH this species of *Ephemeroptera*, so remarkable in its appearance, and on account of the vast numbers in which it emerges during a very short period from the waters of the Tigris and (it is assumed) the Euphrates, may have been noticed by other officers serving in Mesopotamia, yet as far as I know there have been no specimens sent home excepting by Capt. P. A. Buxton and Capt. W. Edgar Evans. That it was so noticed may be gathered from "Notes on Some Asiatic Species of *Palingenia*," by F. H. Gravely ('Records of the Indian Museum,' vol. xviii, pt. 3, pp. 139-143, pls. xviii-xx, April, 1920), who, under the heading "*Palingenia* (s. str.)? *longicauda*, Oliv., *Palingenia* sp. (? *robusta*), Needham, from Seistan," says: "The species probably occurs also in Mesopotamia, as Major Connor writes that he saw millions of the large mayflies on the Euphrates at the beginning of April. They were being eaten up by the ordinary Caspian river tortoise as they lay in heaps in eddies or slack waters. They swarm in the river even as far down as Basra." As the Mesopotamian species is apparently new I describe it as follows:

Palingenia mesopotamica, n. sp.

♂ (dried). Head above dull black, sordid white in front and also posteriorly. Pronotum transverse broader posteriorly, anterior margin sinuous, produced in the middle; posterior margin nearly straight; dull blackish sordid white in the middle and at the sides, sternum black. Mesonotum dull deep black, sutures white, a fine white median line, sternum black. Metanotum in its anterior part black with a white median spot. Legs white, anterior ivory white, slightly tinged with fuscous on the coxae and trochanters. Wings sub-opaque, ochraceous, slightly paler towards the base; they shrivel at the tip when dried. Abdomen robust, of nearly equal breadth to the thorax only slightly narrower in the apical segments, mainly brownish above; posterior margin of segments narrowly whitish; forceps limbs and penis lobes ivory white, setæ ribbon-like,

about $1\frac{1}{2}$ times as long as the abdomen, the joints indistinct. Abdomen beneath whitish or yellowish with a dark line on most of the segments at the lateral borders.

Examples of both sexes in fluid do not differ much from the dried specimens. Dark markings on head more clearly defined (see Fig. 4); a small projection on each side at the eyes and two projecting lobes in front in the middle. The fore legs have fine black lines at the base of the coxae, trochanters, tibiae and tarsi, the joints of the tarsi also faintly annulated; these markings less evident on the other legs. Wings almost white and translucent. The abdomen is rather paler than in the dried specimens and the segments show on the middle above two pairs of faint paler divergent lines sometimes macular. Seta pubescent with uniform hair. Wings apparently unfringed. There are two elongate tubercles at the apex of the fore tibiae in the ♀.

Length of body (from front of head to apex of abdomen, ex. forceps in ♂), 20–21 mm.

Length of fore wing, 20–22 mm.

Length of hind wing, 8–8½ mm.

Two ♂♂ (dried), 7 ♂♂, 7 ♀♀ (in fluid), Buxton; 3 ♂♂ (dried), Evans: All from Amara, April 4th, 1918.

Ulmer, "Übersicht über die Gattungen der Ephemeropteren," 'Stettiner Entom. Zeit.,' lxxxi, 1920, divides the genus *Palingenia*, Burmeister, restricted Eaton, into three genera: *Palingenia*, *Anagenesia* (Eaton's sub-genus), and *Plethogenesis*, Ulmer. The present species does not agree with any of these, and if Ulmer's genera be adopted, a new genus will fall to be erected for its reception. The following characters in *P. mesopotamica* may be noted:

(1) Forceps-limbs 7-jointed, a long basal one, the others short, as in *Palingenia* restricted.

(2) Media of fore wing forked before middle of wing.

Lower branch of cubitus and intermediate cubital vein may arise from anal vein 1 (this character appears to be unstable and these veins may sometimes arise as in *Palingenia* from upper branch of cubitus).

In anal area 1, usually only one long intermediate vein.

Female setae half as long as the abdomen (there is a minute intermediate seta in both sexes).

Fore tarsus of ♂ only about as long as the femur (tarsus 2 mm., femur about $2\frac{1}{2}$ mm.).

These characters are in common with *Anagenesia* and *Plethogenesis*.

(3) Media of fore wing forked later than sector.

Sub-costa and radius very close but distinctly separated at the apex (not visible in fig. 1, Plate II, but easily seen when the wing is floated out in scalding water).

Head with forked process in front.

Fore legs of ♂ longer and stronger than hind legs; femur nearly $2\frac{1}{2}$ mm., tibia $2\frac{1}{2}$ mm. fully.

Intermediate tarsus about as long as the tibia.

Hinder tarsi 5-jointed, 2-clawed, claws unequal.

All as in *Plethogenesia*.

Ulmer refers to a difference in the tenth sternite in *Anagenesia* compared with that in *Plethogenesia*, but I am unable to follow his meaning in this connection.

With regard to the habits of this insect, Evans notes: "Appeared on the Tigris in several spots in and about Amara on April 4th, 1918. They have not been noticed since. They did not fly in the air, but behaved like hydroplanes, circling and skimming over the surface of the water, the long "tails" dragging on the surface, the body slightly raised and the wings beating rapidly." Buxton writes: "Amara, April 5th, 1918. Large mayflies floating down stream in huge shoals for some days past; never seem to fly, though ♂♂ (?) observed chasing ♀♀ (?) along the surface of the water, with much beating of inadequate wings." "After that I never saw them fly, and they got more and more battered by the ripple on the surface of the water. Finished altogether in about a week from their first appearance."

Eaton ("Rev. Mon. of Recent Ephemeridæ," "Trans. Linn. Soc. Lond.", 2nd ser., vol. iii, p. 10) says: "The male of *Palingenia* has very short fore legs; and he is mated, not in mid-air, but upon the river amidst crowds of rivals, who pile themselves up upon him and his surroundings until he is overwhelmed by a large struggling mass of them floating down the stream like a heap of foam, whose resting place (in New Guinea at least) is generally found in the mouth of a big fish." Observations on the Mesopotamian species are not as complete as could be wished, but as far as they go, considering the bulky form of the insect, they point to the improbability of its being capable of aerial movements such as are recorded of *P. papuana*.

A reference to the appearance of these countless throngs of *Palingenia* and to their evanescent character in other countries may not be out of place. Eaton (*op. cit.*, p. 28) gives a summary of a passage from Signor d'Albertis' travels regarding the swarming of *P. papuana* on Fly River, New Guinea: "On July 2nd, 1876, a few hours before sunset, we witnessed a strange and magnificent sight produced by an abundance of a species of mayfly actively pursued by the following birds: *Calornis metallica*, *Artamus cucopygialis*, a *Graculus*, a *Eurystomus*, and the commonest white-headed osprey, *Haliastur girrenera*. Simultaneously the insects were being preyed upon by thousands of fishes, who rushed up to seize them whenever they touched the water with their delicate wings. But so profuse was the abun-

dance of the flies that the ravages of all their destroyers caused no appreciable diminution in their numbers. Mile after mile, from bank to bank, the river seemed covered with them, when all at once, as if by signal, the whole of them rose up confusedly, flying aloft in a thousand different directions, producing an effect in the air like that of a heavy fall of snow ; then they descended again and the snow seemed to cover the river with a white layer. The males very largely outnumbered the females." Eaton also mentions (*op. cit.*, p. 24) that according to Mr. Snellen, of Rotterdam, Swammerdam's statement that *P. longicauda* appears in vast multitudes during one or two evenings only every year "on or about the Feast of St. John" is generally correct, but the date of the swarm is liable to be earlier in warm seasons, sometimes as early as June 10th. Reference may also be made to the great swarms of *Oligoneuria rhenana* which appear on the Rhine, and whose duration is limited to a day or two (Müller, 'E. M. M.', vol. i, p. 262, and vol. ii, p. 182). *Polymitarcys virgo*, Oliv., another mayfly, also appears in great numbers on some of the larger European rivers, giving rise to the local name "*la manne*," and the accumulations of the dead bodies of this species have in some parts of Germany received the name of "*Uferaas*."

Mr. Martin E. Mosely, ever ready to assist, kindly made for me a fine series of slides of the wings and other details, and provided the photograph of the whole insect. For the photograph of the wings I am indebted to Mr. R. M. Adam, of the Royal Botanic Gardens here.

EXPLANATION OF PLATE II.

1. Wings of ♂ (\times about 4).
2. Whole insect, ♂ (\times about 1½), setæ incomplete.
3. Forceps of ♂ from beneath; (*a*) apex of penis lobe from above.
4. Head of ♂ from above; two basal joints of antennæ only shown; position of anterior ocellus uncertain.

Fig. 1, from wings mounted in balsam; the others from examples in fluid.

13, Blackford Road,

Edinburgh;

June 11th, 1920.

SOME UNDESCRIPTED RHOPALOCERA IN THE BRITISH MUSEUM (NAT. HIST.).

By N. D. RILEY, F.E.S., F.Z.S.

PAPILIONIDÆ.

Papilio aristaeus leueus f. *interrupta* f. nov.

♂. The form of *P. a. leueus* in which the yellow discal band of the hind wing upper-side is incomplete is sufficiently common, and also it seems, in the Chiquimayo district at least, in S.E. Peru, sufficiently constant to require a name. In this form typically all trace of the band in question is entirely absent

from area 5, and it is only represented in areas 4 and 6 by a few scattered scales. The remainder of the band is much narrower than in typical *lenaeus*. On the under-side the spots composing the same band are very regular, rounded and well separated from each other, and have much less white in their composition than those of typical *lenaeus*. The fore wing is quite typical.

B.M. Type No. Rh. 160 ♂; Chaqueimayo, S.E. Peru (Watkins).

HESPERIDÆ.

Dainio thetys f. *daiseni*, form nov.

♂. Differs from typical *thetys*, as described and figured by Menetries in 'Cat. Mus. Pet.', p. 126, pl. x, fig. 8, 1857, in that the transverse white band of the hind wing, which in *thetys* is only barely indicated both above and below, is so developed as to form on the upper-side a complete macular band some 3 mm. wide, only becoming slightly diffuse towards costa and inner margin, and below a similar but more diffuse band, nearly twice as wide and running out between the veins in irregular rays, in which minute traces of a darker macular band are discernible. The basal area as far as the white band, except for the costal margin, a large dark oval spot in base of area 7 and a smaller one below in the cell is densely covered with long grey-blue scales.

B.M. Type No. Rh. 141 ♂; Mt. Daisen, Japan.

The type-specimen was obtained by Mr. J. G. Barclay, who has kindly presented it to the Museum. In the same district several others were obtained similar to the type and two males intermediate between them and typical *thetys*, these latter being most like the Amurland form, which frequently has much more obvious traces of the white transverse band on the hind wing than has the Japanese form.

Cogia grandis, sp. nov.

♂. *Upper-side, both wings*: Uniformly dark brown. *Fore wing*: One minute spot in cell at about two-thirds from base, another slightly beyond, close to costa, and a pair just above and beyond cell-end, all semi-hyaline. Two similar very narrow transverse marks across and towards the bases of interspaces 2 and 3. A very fine darker anteciliary line. Fringes lighter brown flecked with black at the extremities of the veins. *Hind wing*: Immaculate. Fringes not flecked with black as in the fore wing, of same shade of brown, but between extremity of vein 2 and anal angle entirely black. A short pencil of hairs of same colour as the wing surface, in the position common to other species of the genus.

Under-side, fore wing: Base, as far as the origin of vein 4, dark brown as above; hyaline markings slightly more pronounced, and also the dark markings of the fringes, than above;

costal, apical and hind-marginal areas blackish, the rest of the wing much paler brown than the basal area, especially along inner margin, and bearing numerous fine dark striae in the distal portions of areas 1 b to 4 : a large quadrate light grey patch occupies the area between the hyaline spot in area 3 and the costa, but does not extend distally beyond the minute pair of hyaline spots just above and beyond the end of the cell ; a similar much smaller diffuse, rather oval-shaped patch midway between this and the apex. *Hind wing* : Basal three-fourths black, the outer edge very irregular but in general direction straight, not conforming to the contour of the hind margin, and traversed by four narrow, very wavy light grey-brown lines at equal intervals, the basal one very indistinct, mainly apparent towards costa, the second fairly well defined, the third least well defined towards the costa, the last the most irregular but well marked, all conforming in general direction with the contour of the hind margin ; the distal fourth light grey with numerous faint darker transverse short striae ; anteciliary line interrupted at the veins and forming a series of narrow internervular lunules ; fringes as above.

Head, thorax and palpi above dark grey, body and antennæ dark brown, the latter darker distally, the club reddish. Palpi below creamy white, thorax, legs and abdomen greyish white, antennæ rather lighter than above.

♀. Considerably larger than the male; the wings more ample and rounded, the pair of subapical hyaline spots on fore wing supplemented by a further two, all four being in line, the hyaline markings in the cell almost indiscernible above ; otherwise as in the male.

Length of fore wing : ♂, 23 mm. ; ♀, 27 mm.

B.M. Type No. Rh. 150 ♂, 151 ♀. Both from Chapada, Matto Grosso, Brazil (H. H. Smith).

Paratypes 1 ♂, 1 ♀ from same locality in B.M. ; 2 ♀, (March 18th, 1829), 1 ♀ (February 25th, 1829), 1 ♀ (March 25th, 1829), Porto Nacionale, Tocantins River, Brazil (Burchell), in Hope Department, Oxford University Museum.

The only point in which the species seems to show much variation is in the size of the hyaline spots on the fore wing ; some of these may even be entirely absent, as is not unusual with such markings.

Thracides verecundus, sp. nov.

♂. *Upper-side, both wings* : Greenish brown, more particularly towards base, with numerous hyaline markings. *Fore wing* : Hyaline spots nine in number : an oblong one in cell slightly before origin of vein 3, a straight row of three small, squarish spots forming a subapical bar, and five in a straight line from area 1 b to 5, that in area 1 b square, not nearly

reaching to vein 2, the next very much larger, triangular, extending right across from vein to vein, the truncated apex just touching vein 3 externally at its origin, that in area 3 squarish, similarly extending from vein to vein, the next linear, reaching from vein 4 to 5, the last (in area 5) a mere point close against vein 5. Fringes concolorous with the wings. No brand. *Hind wing*: Hyaline spots four in number, two in area 4, barely separated, one each in areas 3 and 2, all subquadrate, small, forming a transverse row a little beyond the middle and curving slightly towards anal angle. Fringes rather lighter than those of fore wing.

Under-side, fore wing: Hyaline spots precisely as above and also the ground-colour basally. The costa, however, is light grey brown, the anterior half of cell ochreous; a light grey area precedes the subapical spots but is separated from them by a much darker area of the same extent as itself; beyond the subapical spots is a very diffuse light grey diagonal extending to vein 4, and the rest of the wing is greenish ochreous, except areas 1a and 1b, which are darker brown. *Hind wing*: Hyaline spots rather more obvious than on upper-side, basal third pale grey, outer two-thirds light green, shaded either side of the hyaline spots with rather darker; the inner edge of the green area markedly convex, the two areas merging together in areas 1a to 1c, so that these appear to shade from grey basally to darkish green at the margin, tinged with ochreous.

Head, thorax and abdomen above greenish brown, below light grey. Legs light grey-green. Antennæ above black, below brown ringed with light grey. The club, which is rather stout, pale yellowish; the apex and the hook reddish.

♀. Exactly like the male except that it is rather larger and the wings are more ample.

Length of fore wing: ♂, 20 mm.; ♀, 23 mm.

B.M. Type No. Rh. 158 ♂; Trinidad, Dr. F. W. Jackson. 159 ♀; Venezuela (Godman and Salvin Coll.). Paratype ♂, Corecovado Mt., Rio Janeiro, December 6th, 1825 (Burchell) in Hope Department, Oxford University Museum.

Orses metallica, sp. nov.

♀. *Upper-side, fore wing*: Dark brown; the long hair-scales, occupying approximately the basal half of area 1b and the basal three-fourths of area 1a, give brilliant blue and bronze-green reflections at certain angles; a short, narrow yellow spot just below costa midway between base and apex of wing, and a series of three yellowish, semi-transparent spots in a direct line between it and the anal angle; the upper one crescentic, its concave side towards base extending right across cell; the middle one, in area 2, reaching from vein 3 to 2, large, much broader on vein 2 than on vein 3, the increase in its width being on the distal side;

the third much smaller, subquadrate, not extending halfway across area $1b$ and only divided from the spot in area 2 by vein 2. Two further similar spots about equal in size to the last mentioned are present, one in area 3, at about one-third from its base, oblong, its lower end directed outwardly and resting on vein 3; the other in area $1b$, at about two-thirds from base, oval, and lying along vein 1, less translucent. Fringes of same shade of dark brown as the ground-colour of the wing. *Hind wing*: Ground colour as in fore wing, abdominal area greyer, fringes as far as the extremity of vein $1a$, creamy yellow. The long hair-scales, which cover rather more than the basal two-thirds of the wing, except for those in areas $1a$ and $1b$, bear the same metallic reflections as those of the fore wing, but the reflections are only visible on the alternate halves of each wing at the same time.

Under-side, fore wing: As above, but metallic scaling only present in the base of cell, extending a little beyond origin of vein 2. The translucent markings as above, but the yellow spot on costa and the lower one in area $1a$ both much larger and more diffuse, the costal one fused with the spot in the cell, the other nearly reaching the distal spot in area $1b$. The ground-colour beyond these spots considerably paler than in the basal half of wing, especially towards apex. Immediately preceding apex is a large, roughly equilateral triangular lilacine patch, its base on the costa. Fringes as above. *Hind wing*: Dark brown as above, but without metallic scaling, basally greyish. Hind margin between the extremities of veins 2 and 8 rather broadly creamy yellow, like the fringes, the latter not yellowish beyond the extremity of vein $1b$.

The head (faintly), collar, thorax and abdomen (proximally) above all with metallic reflections like the basal areas of the wings. Palpi anteriorly grey, below white. Thorax and abdomen laterally and ventrally grey. Legs outwardly orange, for the rest yellowish. Antennae black except for the ventral surface of the club, which is bright yellow.

Length of fore wing: 25.5 mm. (28 mm. in paratype ♀).

B.M. Type No. Rh. 157 ♀. Theresopolis, S. Catharina, Brazil (*ex* Godman and Salvin Coll.).

Paratype ♀ in Hope Dept., Oxford University Museum (Miers Coll.).

COLIAS EDUSA. FAB. (*CROCEUS*, FOURC.): ITS SEASONAL FORMS, VARIETIES AND ABERRATIONS.

By H. ROWLAND-BROWN, M.A., F.E.S.

(Continued from p. 157.)

(B) *Forms Tending to Melanism.*

(o) Ab. ♀ *Melanitica*, Verity (1906). With almost the entire wing area upper side suffused with black (*op. cit.*, pl. xlvi).

fig. 9). The illustration shows that this is practically an identical form, though rather more suffused, with that figured for Mr. Fitch's paper (*op. cit.*), the first of the left-hand column. Similar melanic forms are rare; there is an example in the Natural History Museum Collection.

(p) Ab. ♂ ♀ *Nigrofasciata*, Verity (1906). With the discal spot united on the fore wings to the marginal band by a broad black band; the red spot on the hind wings underside extended in long streaks towards the discal spot ('Rhopal Palæaret.,' pl. xlvii, figs. 8, 9). This is M. Oberthür's ab. 1 (*op. cit.*), and is transitional to the form figured for Mr. Fitch's paper (*op. cit.*), the female second of the right-hand series.

(q) Ab. ♀ *Suffusa*, Tutt (1896). Typical form with strong basal suffusion: *trs. ad Melanitica*.

(r) Ab. ♂ *Striata*, Geest. The dark marginal border extended in rays to the middle of the wings.

(c) Variation of Colour and Marking.

(s) Ab. *Velata*, Ragusa (1904). In which the black marginal bands are covered with filmy green scaling (? both sexes). "A Sicilian form" ('Nat. Sicil.,' vol. xvii, p. 42), but by no means confined to the Mediterranean littoral. Translation is not easy; I suggest "filmy" as the nearest equivalent in this connection to "*Velata*" (veiled). I think the filminess may be due to iridescence as in the form *Micans* described below.

(t) ♂ *Atrofasciata*, Rocci (1920). A summer form in which the nervures are indistinguishable to the apex of the fore wings.

(u) Ab. ♀ *Obsoleta*, Tutt (1896). The spots in the marginal (almost or) entirely obsolete. Appears to be synonymous with ab. *Poveli*, Aigner ('Rov. Lapok,' vol. viii, p. 30, 1901).

(v) Ab. ♀ *Subobsoleta*, Rocci (1920). The intermediate form to (q) "with some markings."

(w) Ab. ♂ *Faille*, Stef. (1900). With the series of yellow nervures very distinct, and carried right through the marginal bands of all the wings upper side. Sicily. Often occurs near Florence, and no doubt is widely distributed elsewhere.

(x) Ab. ♂ *Helena* H.-S. (1843). Has "a row of yellow blotches just inside, and touching the marginal hind band, which is narrow" (Tutt). Compare the ♀ ab. third of the right-hand series Mr. Fitch's plate (*op. cit.*)

(y) Ab. ♂ *Micans*, Fritsche (= *Micans*, Konas; = *Micans*, Kiefer). The description by the three claimants to name this aberration suggests identity of form. This being so, Fritsche, as the first in the field ('Int. Ent. Zeit.,' Guben, v, 1911, No. 8, p. 55), is entitled by priority to rank as author. Konas's description ('Iris,' vol. xxxiii, p. 17) is dated 1914—*forma nova*. It is a male with a violet lustre present on the hind wings. Kiefer also describes it ('Ent. Rdsch.,' xxx, pp. 32

and 54). Fritsche's description extends the violet lustre, suggestive of *C. aurorina heldreichi*, to all the wings, and he compares it to that of *Apatura iris* and *A. iole*. As we all know, typical ♂ *Edusa* are often suffused with a rosy glow, which may or may not be transient, if, as I suspect, the glow is apparent in all freshly emerged individuals of the gen. *æst.* Mr. Fitch (*op. cit.*) confirms the occurrence of ab. *Micans* in this country in 1877.

(z) Ab. ♀ *Divisa*, Verity. Marginal band hind wings complete; sharply divided by series of light markings which together form a discontinuous line.

(aa) Ab. ♀ *Semidivisa*, Rocci (1920). With the same characters as *Divisa* on the hind wings.

(bb) Ab. ♀ *Internodimidiata*, Verity. The lemon blotches confined to the inner margin of the band on the hind wings.

(cc) Ab. ♀ *Semiobsoleta*, Rocci (1920). Blotches on the marginal band of the hind wings completely wanting.

(dd) Ab. ♀ *Seriata*, Rocci (1920). A form of the type having the series of the small ferruginous spots on the under side of the hind wings, usually absent, complete. The series is normally complete in gen. *vern.* and gen. *autumn.*

(ee) Ab. *Deannulata*, Rocci (1920). The small silver spot above the discoidal spot on the under-side hind-wings absent. The double silvered spots detached on the ground-colour.

(ff) Ab. *Bimaculata*, Verity. As in (ee), but on the upper side of the hind wings.

(gg) Ab. *Egra*, Verity. Underside of the fore wings irregularly spotted with pale black. On the upper side also in the discal area. A pathological example.

(d) Chiefly Variation of Size.

(hh) Ab. *Minor*, Failla (1889) (= ? var. *Pyrenaica*, Gr. Gr.). I have already discussed this so-called aberration in its relation to *Vernalis*. A small form is constant in both sexes in the gen. *vern.* of the South of France, and is not uncommon in November emergences when they occur in Britain. Fitch figures in colour (*loc. cit.*) a female of what he calls the third brood, and gives in the text a woodcut of a male with much contracted hind wings. Unless ab. *Minor* is to be applied to all diminutive examples of whatever generation—and I suppose the author so intended—it is somewhat difficult to separate this form from the following:

(ii) Var. *Pyrenaica*, Gr. Gr. ('*Horæ Soc. Russ.*', 1893, p. 383). This is described as follows:

"Varietas fere duplo minor. Alis ♂ pallidioribus, posticis in disco cinereo-sparsis; ♀ alis anticis ex flavidо-rutilis, posticis griseis, leviter aurantiaco-pulverulentis; maculis flavescētibus in limbo externo positis subnullis. Volat in alpibus Pyrenaicis."

If identical, therefore, with ab. *Minor*, *Pyrenaica* falls to it.

But I think the name may be retained. In the Pyrénées-Orientales de Graslin found this form at Collioure, pale yellow, the colour of Stephens's *Chrysotheme* (= *Helicina*), while at the other end of the chain a very small form is reported constant in the foot-hills of the Basses-Pyrénées ('Cat. Lépids. Basses-Pyrs.', M. Larralde, 1895).

(jj) Ab. *Ampla*, Verity (1919). The author says that in Sicily a distinct race of *Edusa* occurs; it is also the finest on account of its large size and very bright colouring; in a series of the second generation from San Martino (May 15th-30th) the largest males reach 49 mm.

(To be continued.)

OXIGRAPHA LITERANA, L.: ITS LIFE-CYCLE, DISTRIBUTION, AND VARIATION.

By W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 161.)

Ab. *asperana*, Schiff.

Schiffermüller's name raises an extremely difficult and obscure question. It is, of course, well known that his descriptions are so fragmentary and insufficient, that in those in which there is an absence of confirmatory evidence of their meaning by other writers who had seen the actual specimens they were made from in his collections, they are usually dropped; fortunately his collection of micros, some years after his death, was carefully gone through by two independent witnesses—Charpentier and Zincken—who compared his actual specimens with the figures of Hübner and left the record of their work in 'Die Zinsler, Wickler, Schaben und Geistchen.' Unfortunately Schiffermüller described some of his species from specimens in other collections than his own, and did not possess a type. *Asperana* was one of these, and he says of it—"in the collection of M. P." Now who "M. P." was is not certain. He was, however, a well-known Lepidopterist, judging from the fact that Schiffermüller described about twenty species from his collection. I have not much doubt, however, that these initials represent those of Matthias Piller, a Hungarian Jesuit. Schiffermüller named *Pilleriana* from specimens in the collection of "M. P." (see s.v., p. 126, No. 2). Fabricius ('Ent. Syst.', tom. iii, par. ii, p. 252) writes of *Pilleriana* that it "was named after Piller, a Hungarian Jesuit." Hagen, vol. ii, p. 46, writes of Matthias Pillar as the author of a work on entomology in 1782-3, or a few years after the date of Schiffermüller's book.*

* Since the above was written I find in the 'Accentuated List of British Lepidoptera,' published in 1858, p. 61, "*pilleriana*, named in honour of Piller, one of the Theresian Professors at Vienna." Evidently Piller was a close friend of Schiffermüller.

When Charpentier came to overhaul the collection after Schiffermüller's death he evidently did not know who "M. P." was, for he uses the initials in writing of them, and not the full name. It is to be inferred from this that the whereabouts of "M. P.'s" specimens when they could have been compared with Hübner's figures was not known, and we are thus reduced to the original description.

Schiffermüller arranged his Tortrices in groups according to colour, and *asperana* is put amongst those which are "cinereæ," which I take it from the species included would mean grey or brownish grey. His description of *asperana* is "grey, with variegated roughened wings," that is all!

Schiffermüller may have described a form of *literana*; on the other hand his specimen may have been some other species which was grey and had roughened wings, such as a form of *Peronea hastiana*, *P. sponsana*, or *P. niveana*. The only grey examples I have seen are four in the collection of Mr. R. South; but Barrett writes ('Brit. Lep.', x, p. 217) of one taken in Suffolk at Bungay by a lady, "grey white with the usual abundant black dotting, but no trace whatever of green."

Certain writers deal with ab. *asperana*, and I give the citations for what they may be worth, which, I fear, is very little: Charpentier, 'Zins. Wick.', p. 74 (1821); Hübner, 'Verz.', p. 386, No. 3747 (1826); 'Treitsche,' viii, p. 166 (1835); Frey, 'Lep. Schweiz.', p. 284 (1880); Snellen, 'Vlinders,' viii, p. 185 (1882); Kennel, 'Pal. Tort.', p. 83 (1908); Wagner, 'Lep. Cat.', par. x, p. 69 (1912).

Hübner in 'Verz.' (1826) says *Treueriana* (= *niveana*) and *asperana*, Schiff. = *squamalana*, Hüb., 'Tort.', 93, 94 and 95, but in his copy of 'Schiffermüller,' now in the Walsingham Library—in which in his own handwriting is placed opposite all the species he figures in his work the numbers of each figure—*asperana* is without a number.

Herrich Schäffer says of *asperana* in 'Schmett v. Eur.', p. 152: "There is a good specimen in Schiffermüller's Collection which resembles Hübner's fig. 94," but this figure is not pure grey, but has bright green mixed with the grey. As there was no specimen when Charpentier saw the collection in 1821 it is evident it was placed there after that date.

Herrich Schäffer figures two grey forms as *asperana* ('Tort.', pl. i, figs. 2 and 3). Fig. 2 represents a form with a number of black markings; fig. 3 a grey form, apart from colour identical with ab. *squamana*, Fab.

Ab. *flavana*, n. ab.

I give this name to a form with the ground-colour of the superiors brownish buff. It has certain of the black dots that are common to so many of the *literana* forms, and, except for the

buff ground-colour of the superiors, it resembles in all respects ab. *squamana*, Fab.

The only specimen I have seen of this aberration is one which came from the New Forest during September, 1919, but Kennel, 'Pal. Tort.,' taf. v, fig. 4, figures a very similar but slightly browner form, which he incorrectly terms *irrorana*, Hüb., from "Schilka, Collection Grand Duke Nikolai Mikhailovitch."

Ab. *irrorana*, Hüb. (Plate I, fig. 8.)

Synonymy.—*Irrorana*, Hüb., Tort., fig. 96 (1797); Hüb., Verz., p. 386, No. 3751 (1826); Curtis, Guide, p. 173 (1829); Stephens, Cat., p. 188, No. 7097 (1829); Rennie, Conspect., p. 180 (1832); Curtis, Brit. Ent., pl. 440, and No. 4 (1833); Stephens, Haust., iv, p. 165 (1834); Wood, Ind. Ent., fig. 1100 (1839); Westwood, Brit. Moths, pl. 96, fig. 12, and p. 164 (1845); Staudinger, Cat. Lep. Eur., p. 94 (1861), and p. 234 (1871); Frey, Lep. Schweiz., p. 284 (1880); Snellen, Vlinders, p. 176 (1882); Spuler, Schmett. Eur., p. 242 (1908); Wagner, Lep. Cat., par. x, p. 69 (1912).

Hübner's fig. 96 is unmistakable, but there is no description. The figure shows the superiors with greyish-green ground-colour thickly sprinkled with intensely black dots. It has the usual transverse lines, which are generally not apparent in British examples, or that are only faintly indicated in a few instances. Ab. *irrorana* is perhaps the most beautiful of all the *literana* forms, the black dots on the light green ground showing up very prominently, and contrasting exquisitely with them. It is well figured also by Curtis and Wood. The former's figure, which is slightly enlarged, is the best of all. Both these authors, of course, depict the English form.

Irrorana is not by any means an abundant form; it occurs in most of the localities in which the species is found. I have eight examples from the New Forest.

Ab. *squamulana*, Hüb. (Plate I, fig. 9.)

Synonymy.—*Squamulana*, Hüb., Vogel, fig. 14 (1793); Hüb., Tort., fig. 95 (1796); Hüb., Verz., p. 386, No. 3749 (1826); Frey, Lep. Schweiz., p. 284 (1880); Snellen, Vlinders, p. 176, No. 11 (1882); Wagner, Lep. Cat., par. x, p. 69 (1912).

Hübner, of course, does not describe this aberration; his figs. 14, 'Vogel,' and 95, 'Tort.,' are identical, except that in the former the disc of the superiors is greyish, whilst in 'Tort.' it is dark sage-green. In 'Tort.' he names figs. 92, 93, 94 and 95 as *squamulana*, but only the last figure agrees with his figure in 'Vogel.' Fig. 92 is what he subsequently in 'Verz.' named *aerugana*. In this work he retains the name *squamulana* for the other three figures. These three figures represent forms about

as wide apart as this species can produce; thus fig. 93 represents a form I have never seen, which has the superiors almost white crossed with very strong wavy transverse bands; fig. 94 is an extreme form of what I call ab. *mixtana*.

Ab. *squamulana* is evidently a very rare form. The only British example I have seen is a very beautiful one from the New Forest in the collection of Mr. South, which is given in fig. 9 of the plate. It agrees well with Hübner's figure, 'Tort.,' 95, except that it has the ferruginous patch which is missing in that figure but is found in 'Vogel,' fig. 14.

Hübner's fig. 14, 'Vogel,' I describe: Superiors greyish brown with a series of short black lines on the costa and on the hind half of the inner margin; at the base of the inner margin there is a ferruginous patch, which is not apparent in 'Tort.,' fig. 95, but in this figure there are some of the black longitudinal lines that are found in the figure in 'Vogel.'

(To be continued.)

SOUTH AMERICAN EUMOLPIDÆ, MOSTLY OF THE GROUP COLASPINI.

BY FRED. C. BOWDITCH.

(Continued from p. 172.)

Colaspis fuscipes, sp. nov.

Small. Bright rufous; eyes black, jaws, antennæ and legs almost entirely dark fuscous; thorax densely punctured except the discal base; sides strongly unidentate at the middle. Elytra strongly transversely depressed; the base and sides longitudinally ridged, and with raised rugosities; the lateral ridge or costa well defined nearly to the apex; on the remaining surface the punctuation is lineate, with rather raised interspaces, becoming costate at the apex.

Type, ♀, San Augustin, Mapiri, 3500 ft., September, 1895 (Stuart).

Length, 3·5 mm.

Head smooth, convex, only slightly depressed between the eyes, punctate; thorax slightly collared anteriorly, thickly and quite evenly punctate; basal ridges of the elytra are best seen by looking squarely from behind parallel with the top of the elytra, when they appear separate and plain, being broken by the basal depression, on the side becoming broken into separate tubercles, and the disc lineate punctures. The ♂, which is unknown, is probably without tubercles or costæ.

Colaspis obliqua, sp. nov.

Small; elongate parallel. Body below light brown with æneous lustre; tip of abdomen rufous; above, bright brown with a distinct

bronze colour, the latter predominating on the head and thorax, the former more in evidence on the elytra; all the margins more or less distinctly cyaneous; an ill-defined but at the same time noticeable wheal or ridge from the shoulder diagonally to the apex, and especially appearing just behind the middle of the elytra; entire upper surface thickly punctate, mostly confluent, forming transverse rugæ.

Types, two ♂, two ♀, Cochabamba, Boliv. (Germ.).

Length, 3 mm.

Head thickly punctate, with a well-marked depression and longitudinal groove; antennæ rufous, last joints partly darkened; thorax slightly collared, thickly and evenly punctate, with a few smooth areas. Sides angulate back of the middle. Elytra only slightly depressed within the shoulder, densely geminate, punctate in the disc, confluent and transversely rugose at base and sides, and deeply striate punctate at the apex; the diagonal wheal forms a somewhat smooth, narrow space, the rear end of which becomes the third interspace. The elytra of the ♀ are a little more costate as to the intervals, but the diagonal is about the same in the sexes; the apices of the tibia and tarsi are more or less fuscous. Related by its shape to *foreolata*, Lef.

Colaspis bidenticollis, sp. nov.

Very small; short and stout. Metallic, cyaneous green, shining; labrum, antennæ and legs flavous; thorax thickly and finely punctured, sides bidendate at and before the middle; elytra obsoletely transversely depressed, very finely, seriatelv, semi-geminately punctate, costate and lineate, punctured at the apex; surface semi-alutaceous.

Type, ♂, Rio Tucuman, Argentina (Bruch) (second Jac. Coll.).
Length, 2.5 mm.

The size of a small *C. pusilla*, Lef., head wide, front almost flat, thickly evenly punctate, thorax feebly impressed either side back of the middle; form quadrate, not much narrowed in front; the apex of the elytra has a rather noticeable depression which produces a semi-tubercle effect. The antennæ reach just below the shoulder and have the last five joints more or less thickened (like *Nodonota*); the legs also seem thickened and the prosternum is flattened. As Mr. Jacoby remarks in his description of *Alethaxius angulicollis* ('Trans. Ent. Soc.', 1900, p. 490), this and the two following species are forms for which it is difficult to find the proper place, and do not quite agree either with *Colaspis* or *Alethaxius*.

Colaspis denticollis, sp. nov.

Very small, stout. Body below æneous bronze; above, head, thorax and scutellum cyaneous blue; elytra violet purple, very

narrowly edged with cyaneous; labrum, antennæ and feet wholly rufous; the legs robust and short.

Type, 1 ♂, Tucuman, Argentina.

Length, 2·5 mm.

Antennæ reaching nearly the middle of the elytra; last five joints much thickened (like *Nodonota*); head thickly punctate, opaque; thorax with anterior angles very prominent, sides strongly and sharply unidentate at the middle, scutellum smooth, elytra somewhat impressed within the shoulder, widening into a faint transverse depression, the surface very finely semi-seriate punctate, much plainer at the apex and sides, where the intervals are somewhat raised.

Mr. Jacoby's remarks referred to in my description of *bidenticollis* apply also to this species.

Colaspis æneus, sp. nov.

Very small; short, parallel. Above and below æneous bronze, shining; feet, antennæ and mouth parts entirely fulvous; head and thorax thinly, finely and evenly punctulate, sides strongly angulate at the middle; elytra finely semi-geminate punctate striate, costulate at the apex, the surface very finely alutaceous.

Type, 1 ♂, Tucuman, Argentina (Baer).

Length, 2 $\frac{1}{2}$ mm.

Head with usual cross depression, and a well-defined fovea at the vertex; antennæ with last five or six joints much thickened (like *Nodonata*); thorax very lightly collared and with a slight fovea on either side behind; anterior angles prominent. Elytra somewhat impressed within the shonlder, widening into a faint transverse depression (like *denticollis*), and, like that species, an aberrant form.

Hermesia, Lef.

This genus of Lefevre's was founded for *C. aurata*, Oliv., a well-defined form from Cayenne, in which the hind tibia of the ♂ is strongly angulate within, at nearly the middle; body above brilliant metallic golden or coppery green. Mr. Jacoby joins with this species certain forms from Bugaba and Chiriqui. My four examples from these places include three of those referred to by Jacoby, and they are all ♀'s. He also includes three specimens from Chontales described as *Rhabdophorus violaceus*, one of them said to be a ♂; the other two examples are before me and are ♀'s, ? as to the ♂. What is probably another species, and at present lumped with *aurata*, is the Bolivian form, either green or eyaneous blue, but in which the dilation of the hind ♂ tibia seems much less developed, but more ♂'s of *aurata* from Cayenne should be in hand before separation.

Hermesia cyanea, sp. nov.

Form and size of a small *aurata*. Below and legs cyaneous bluish, above shining metallic, cyaneous green; thorax minutely and on the disc remotely punctulate; elytra strongly transversely depressed, and closely punctate striate, becoming very fine at tip.

Hind tibia of ♂ dilated within, half-way between the apex and middle, very much nearer the apex than in *aurata*.

Type, 1 ♂, St. Catharina, Brazil; also 1 ♂, 2 ♀, Amaz. Vall., near Santarem.

Length, 5 mm.

Very close to *aurata*, Oliv., but the ♂ easily separated by the difference in the hind tibia, *aurata* having the angulation median, this species much nearer the apex. The antennæ are fuscous with rufous base, and metallic colouring on the scape; head very sparsely and finely punctate, like *aurata*; in fact all the punctuation is very like that species, but in the ♀ *cyanea* the sides of the thorax are more distinctly angled behind the middle.

Hermesia ænea, Jac., seems to depart from the rest of the genus in the form of the thorax, being analogous to that group of the genus *Rhabdopterus* represented by *erosulus*, Lef., i.e. thorax widened near the base, as cited by Mr. Jacoby ('Trans. Ent. Soc.', 1900, p. 173).

Hermesia Jacobyi, sp. nov.

Size of *aurata*. Uniformly brown, like *brunnea*, but a little brighter; thorax broad, sides strongly unidentate at the middle, with a well-marked sinuation in either side of the tooth; sparsely punctate, though somewhat segregated into groups, leaving smooth areas; elytra semicircularly depressed at the shoulder, strongly and closely seriate punctate, somewhat fainter, and with slightly raised intervals at apex.

Type, ♂, Peru (Marcapata?) (second Jac. Coll.).

Length, 6.5 mm.

Front with well-marked transverse depression; antennal joints 8 to 11 missing, third slightly shorter than fourth; thorax with rear edge strongly sinuate at middle. One of the largest smooth areas (irregular) is on the disc. Scutellum smooth impunctate, elytra parallel, punctuation nearly uniform; first tarsal joint of the anterior and middle legs very fully dilated. Easily separated by its thoracic characteristics.

Hermesia similis, sp. nov.

Short and robust. Body below black, slightly tinged with green, labrum, antennæ and legs rufous; above metallic green, cyaneous; thorax thickly and at sides confluent punctate; elytra closely and strongly punctured, seriate at the base and middle, finely punctured striate at apex.

Type, 2 ♂, 2 ♀, Cochabamba, Boliv. (Germ.).

Length, 4 mm.

Head thickly punctured, with rather a prominent frontal depression and transverse groove; thoracic margin not very wide, faintly sinuate angulate at the middle; punctures fine and large, mixed, crowded, with the not uncommon smooth area at the middle base; elytra with well-marked basal and cross depressions. Form rather stout and convex, like *lampros*, Jac., but colour green in place of coppery and general form not so large.

Hermesia confusa, sp. nov.

Nearly the size, shape and colour, i. e. fulvous brown, as *brunnea*, Jac., with a tendency in some examples for the elytra and legs to become piceous or purplish; thorax scarcely subangulate at the sides, and finely punctured (both like *brunnea*); elytra geminate punctate, nearly obsolete at the apex, the intervals in the ♀ plainly marked with smooth, slightly elevated lines, less noticeable in the ♂.

Type, 4 ♂, 3 ♀, Mineiro, Goyaz, Brazil.

Length, 5–6 mm.

A specimen of *brunnea*, Jac., ♀, from Jacoby's collection, and probably one of the three examples referred to in his description ('Trans. Ent. Soc.', 1900, p. 489), is before me; the main difference between *brunnea* and *confusa* is the elytral punctuation; it is very much stronger and thicker in *brunnea*, and without the geminate, costate arrangement of *confusa*; the apical punctuation is much stronger in *brunnea*. The geminate character of the punctures varies somewhat in different examples, and sometimes the series may be three punctures in place of two.

Hermesia inermis, sp. nov.

Similar to a small *aurata*, Oliv., but entirely dark violet, with the base of antennae and labrum rufous; thorax finely punctate; elytra finely punctate striate, with smooth intervals at apex; hind tibia of ♂ without any dilation, such as is present in *aurata*.

Type, ♂, ♀, Columbia (Pelke) (unnamed in Jac. Coll.).

Length, 4–5 mm.

Head, especially the epistome, rather coarsely punctured, with a deep transverse depression; scape of antennae partly cyaneous; thorax transverse, margined and subangulate behind the middle; most of the punctures very fine, but here and there a coarser cluster, especially at the sides. Elytra with short and deep basal depression, showing coarser punctures. Closely allied to *aurata* and *cyanea*, but easily separated by the simple hind tibia of the ♂.

Agbalus, Chap.

This genus is founded upon *A. sericeus*, Chap., which is finely pubescent, with short antennae and legs, and the ♂ with a strong spur on the hind tibia; Lefevre added various non-pubescent forms with slender legs and long antennae, and Jacoby added *puncticollis* and *tenebrosus* from Mexico without the tibial spur. Now occurs an intermediate form with dilated tibia.

Agbalus dilatipes, sp. nov.

Medium sized, ovate. Dark chestnut brown, æneous shining; the margins and elytral punctures faintly metallic green; the breast also dark green æneous; legs short and stout, the hind tibia of the ♂ sharply angulate within at the posterior third, the angulation furnished with long yellow hair.

Type, 2 ♂, 1 ♀, Paraguay (Dr. Bohis).

Length, 4 mm.

Form convex, front with a small fovea, or subsulcate, the transverse depression feeble; punctuation fine, sparse on the vertex; thoracic punctuation excessively fine and even, slightly thicker and coarser at the sides; elytra closely punctate, arranged in striate form, coarser at the sides, and finer at the apex, and with slightly costate intervals, especially in the ♀; transverse depression feeble.

The dilation of the ♂ tibia causes the apex beyond the angle to appear emarginate.

If I am correct in my identification of *Colaspis humeralis*, Baly, it occurs from St. Catharina, Brazil, running from the form having red humeral spots to uniform coloured elytra. The descriptions seem to agree perfectly, but the species seem much more naturally placed in *Agbalus* than *Colaspis*, coming next *Agbalus plagiatus*, Lef.

(To be continued.)

NOTES AND OBSERVATIONS.

WE hear that Esher Common (or Claremont Woods), which naturalists of west and south London know so well, may possibly be turned into golf-links. The Esher and Dittons Urban District Council has been approached by a syndicate for this purpose. If this comes about the value of the common as a lung of west and south London will be removed, and the *very* interesting and characteristic fauna and flora will be destroyed. Having regard to the present need of producing timber, the common should surely be allowed to reafforest itself, which it has already begun to do.

POLYGONIA C-ALBUM ON THE COTSWOLDS.—It may be of interest to record that on July 4th I saw a fine, dark example of *P. c-album* at Owlpen, near Nailsworth, on the Cotswold Hills.—B. A. CONEY; Pucklechurch, Gloucestershire.

EREbia EPIPHRON IN 1921.—On June 27th in a certain favoured spot very high up in Cumberland, I saw *Epiphron* flying in hundreds, but already in well-worn condition. Eight days before I was on Helvellyn and on the look-out for them, but did not see a single example.—B. A. CONEY; Pucklechurch, Gloucestershire.

EARLY AND LATE OCCURRENCES OF HESPERIA MALVÆ.—In reply to Mr. Jaques' inquiry in the June 'Entomologist,' I may say that, although I have recorded earliest dates for *H. malvæ* for thirty-two years, there is among them none earlier than May 5th, 1906. But

this, I think, is owing to the fact that in 1893 I was living in a part of Lincolnshire in which I never found the species. In that wonderfully early year, greatly resembling in this respect the present year of grace, there may be found on p. 247 of vol. i of Tutt's 'British Butterflies' no fewer than fifteen records of this species occurring in April, the three earliest being April 7th at Hereford, April 9th at Eynsford and April 10th at Stroud, all these being earlier than Mr. Jaques' date of April 12th. This spring I was unable to visit the haunts of *malvae*, a few fields away from here, till May 13th, when I saw several specimens on the wing, but I am taking it for granted that it was out in April, and therefore that a freshly emerged male I took yesterday (June 28th, 1921) almost certainly belonged to a second brood. The locality is a hot grassy field, surrounded on three sides by a wood, and I cannot conceive that a hibernated pupa failed to emerge during the glorious weather we had in April and in May. Among Tutt's records *in loco citato* I find July 16th, 1905, at Shepton Mallet. This is probably also a second emergence, as the species was out early in this year also, viz. on May 9th here at Hazelleigh, and in April near Wendover. Against my argument, however, are two late dates in such a backward year as 1902, when Burrows took it at Chattenden on July 16th, and Whittle found it at Thundersley on August 2nd—probably the only August date ever recorded in Great Britain.—(Rev.) GILBERT H. RAYNOR; Hazelleigh Rectory, Maldon, Essex.

OVIPOSITING OF *SESIAS MYOPÆFORMIS*.—I was interested to see a ♀ *S. myopæformis* depositing ova on July 2nd last in a very hot sun. The insect hovered in front of the apple-trunk in circles, with wings vibrating almost like a burnet. Once a suitable position was found the insect alighted, curving its abdomen, with the anal tuft fanned out, and, so far as I could ascertain, the ova were deposited at the back of loose pieces of bark. The whole operation took about three seconds, the wood selected being the almost dead wood adjoining the living.—G. BERTRAM KERSHAW, M.Inst.C.E.; West Wickham, Kent.

OXIGRAPHA LITERANA, L., IN LANCASHIRE.—I took a specimen of this moth off a silver birch trunk in Eggerslack Wood, Grange-over-Sands, on April 25th, 1920. It is type form, resembling fig. 1 of Plate I in the June 'Entomologist.' There appear to be few or perhaps no previous Lancashire records.—J. DAVIS WARD; Limehouse, Grange-over-Sands.

ERRATIC EMERGENCES.—On June 27th a specimen of *Tæniocampa mimosa* emerged in my pupæ-cage, the rest of the brood having come out normally in early April. I have now a further lot of pupæ of the same species from larvæ which my children beat at Arnside on May 16th. These went down about June 7th, ten days earlier than those I had last year, to which the above belated specimen belongs. *Nemeobius lucina*, bred from the egg last summer, and kept during the winter in my sitting-room, began to emerge in January, and dribbled out, one or two each week, till the last, which appeared yesterday, June 26th, a full month after the wild ones were flying. This species is spreading rapidly in Westmorland. My friends all tell me that Lepidoptera are scarce this season here, though the early part of the

year seemed encouraging. The weather since May has been dry with persistent north-east winds, but we have had nothing like the extreme drought reported for the south-eastern counties.—FRANK LITTLEWOOD; Kendal, Westmorland.

[Writing on July 15th, and referring to *N. lucina*, Mr. Littlewood remarks: "To-day another specimen (♀) has emerged in my pupæ-case."]

BUTTERFLIES IN WEST SUSSEX.—The hibernating species have been comparatively scarce this season, and for the first time in five years *Eugonia polychloros* has not been observed. *Pieris rapæ* was first seen on March 27th, *Euchloë cardamines* on April 2nd, *Cyaniris argiolus* and *Pararge egerides* on April 12th. Then followed nearly a fortnight of cold weather during which nothing was seen. *Pieris brassicæ* appeared on April 28th, and on April 29th, a beautifully warm day, *Pieris napi* was seen. *Brenthis euphrosyne*, two seen, one taken, and *Callophrys rubi* taken. April 30th *Hesperia malvæ* and *Thanaos tages* were sought for and seen. On May 9th a single male *Leptosia sinapis* was taken in a locality from which, so far as I know, its occurrence has not been previously recorded, proving that the species is not yet quite extinct in West Sussex. *Pararge megæra* was seen on the same date, and on May 10th *Cœnonymphpa pamphilus*. *Lycæna icarus* was seen on May 16th, and the last of the first brood of *P. egerides* was seen on May 17th. *Nemobius lucina* was fully out on May 19th, *Brenthis selene* on May 25th, and on May 27th *Lycæna bellargus*. On June 2nd the second brood of *P. egerides* was on the wing. On June 10th *Epinephile jurtina* appeared, and the moths of *Tortrix viridana* were flying four or five days earlier than last year. The plague of these has not been so bad this season as during the three previous years. On June 13th *Augiades sylvanus* was seen. On June 17th two *Euchloë cardamines* seen—a very late date. On June 23rd *Limenitis sibylla* was fresh out, and on June 24th *Argynnis paphia*.—CHARLES M. WOODFORD; The Grinstead, Partridge Green, Sussex.

SYMPETRUM FONSCOLOMBI, DE SELYS, IN DORSET.—That other observers may be on the alert; it may be well to record at-once the re-appearance of *Sympetrum fonscolombii*, de Selys, to my great satisfaction, on the more eastward of the two ponds in this neighbourhood, where the species appeared in July, 1912, 1913 and 1914, but from which it had, perhaps rather doubtfully, seemed entirely absent since. My watch may have become rather perfunctory for the last two or three seasons, and the days possible for observation sometimes turned out not too good for dragon-flies in certain of the six barren years. Yet the first insect, seen on my arrival on the 11th inst., was unmistakable, and I found a sprinkling of males all around the pond, while I followed up over the heath, but unfortunately lost sight of, what looked like a very teneral, glossy-winged female. I took one male so as to have tangible evidence of its presence. On July 13th I again found the same sprinkling of males, and took one female. On July 12th I visited the other, more westward pond, in further search, but found it reduced to hardly more than a puddle, and, of course, no trace of the dragon-fly present. The constancy of the

July date of appearance seems to me to have great significance, and also the fact that no other heathland ponds save the two mentioned, either in this or in previous years, have produced the insect—a further surely most significant coincidence. The weather has, of course, been ideal.—F. H. HAINES; Brookside, Winfrith, Dorset, July 14th, 1921.

BLOOD-SUCKING THYSANOPTERA.—In corroboration of Mr. C. B. Williams' note in the July number of this Journal (p. 163), I may mention that I was bitten by small *Thysanoptera* on several occasions during my residence in Ceylon. On feeling a small but sharp prick one would find the little creature puncturing the skin of the wrist or face, but I never allowed one of them to remain long enough to distend itself with blood, as described by Mr. Williams. I believe that it is recognised that certain species of *Thrips* are predatory upon other small insects. I have found them, for instance, occupying the tunnels of Scolytid beetles, where they were almost certainly preying upon the larvae of the borers. I think it is doubtful, however, if any *Thysanoptera* habitually suck the blood of warm-blooded animals. I always regarded such occurrences as in the nature of an experiment on the part of the insect, which, finding itself accidentally settled on a soft body, automatically sampled the contents. It is conceivable, however, that from such small beginnings might be evolved an habitually blood-sucking race of *Thrips*.—E. ERNEST GREEN; Camberley.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—April 6th, 1921.—The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc., in the Chair.—The following were elected Fellows: Miss J. Riddell, Los Angelos, California, U.S.A.; Mr. C. Dover, The Indian Museum, Calcutta, India; Mr. D. J. Atkinson, Broadoak House, Newnham, Gloucestershire; Mr. L. B. Hopper, Manor House, Penryn, Cornwall; Mr. F. H. Lancum, Fernside, Shepherd's Lane, Dartford; Mr. F. D. Coote, 11, Pendle Road, Streatham, S.W.; Mr. H. E. Box, 151, Stamford Hill, N. 16; Mr. H. M. Sims, B.Sc., The Farlands, Stourbridge; Mr. H. H. Wallis, M.A., 145, Wilmer Road, Heaton Road, Bradford; Mr. F. Rhodes, 113, Park Row, Heaton Road, Bradford; and The Rev. G. Watkinson, M.A., Woodfield, Hipperholme, Near Halifax.—Mr. E. E. Green, remarking on the early appearance of Lepidoptera this season, stated that an example of *Xanthorhoe fluctuata* had come to light on March 12th, while in regard to the hibernation of *Pyrameis alalanta* in Britain—a still debated question—he had observed a specimen at sallow on March 17th at Camberley.—Mr. C. B. Williams exhibited a case of insects from tropical America, including a *Monadela* species of wasp which buzzed only when digging and spreading mud, and examples of insects distinctive to sugar-cane.—Lt.-Col. H. D. Peile, a number of interesting Lepidoptera (*Rhopalocera*) taken on the N.W. frontier of India and in N.W. Persia, including a gynandromorphous specimen of *Colias glicia*, and a series of

Zephyrus quercus mesopotamica of large size and brilliant purple colouring.—Mr. J. H. Durrant, a series of *Blastobasis lignea*, Wlsm., including var. *adjustella*, Wlsm., captured in Lancashire, a member of the *Blastobasidae*, a family not hitherto taken in Britain.—The Rev. J. Waterston, examples of *Apanteles americanus*, Lepeletier, and its hyperparasite *Horismenus nigro cæneus*, Ashmead.—The President said he suspected that the host on which this *Apanteles* was parasitic was *Phlegethonius rustica*.—The following papers were read: Mr. A. M. Lea, "On some *Chrysomelidae* (Coleoptera) in the British Museum," and Mr. K. G. Blair, "Types of *Heteromera*, described by J. Walker in the British Museum."—The President announced that the Library was now available for lending books to Fellows, and after a discussion it was resolved unanimously that the Society's new rooms at 41, Queen's Gate, S.W., should be opened from 5 p.m. to 10 p.m. on the third Wednesdays in the months of February, April, May and June, for an informal meeting of Fellows and their friends.—H. ROWLAND-BROWN, M.A., Hon. Secretary.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—April 14th.—Mr. K. G. Blair, B.Sc., F.E.S., President, in the Chair.—Miss L. E. Cheeseman read a short paper on "The Parasite of *Sirex gigas*: *Rhyssa persuasoria*," (Hym.) and illustrated it with lantern-slides. Mr. Edwards exhibited the parasite from both Britain and the Continent.—Mr. H. Main, larvæ of *Geotrupes*, sp. (Col.), and described their movements and economy.—Mr. Newman reported *Triphæna pronuba* at sallow March 9th, *Callophrys rubi* on April 10th, and the early abundance of *Euchlöe cardamines*.—Mr. Blair, living larvæ of *Photuris pennsylvanica*, a fire-fly of the Eastern United States.—Mr. Main, for Mr. Enifer, larvæ of the red mite, *Trombidium*, common in gardens, and remarked on its polyphagous habits.—Mr. Bennett, *Callidium variable* (Col.), bred from an oak plank.

April 28th.—The President in the Chair.—Mr. H. L. Dalton, of Reading, was elected a member.—The Rev. J. Waterston, B.D., B.Sc., gave an address, "The Natural History of Macedonia," illustrated with lantern-slides, and a large number of insects other than Lepidoptera by himself and Mr. K. G. Blair, with additional slides by Dr. Forbes and colour sketches of the scenery by Major Cottam.—Mr. Blair exhibited a collection of Lepidoptera sent by Mr. G. B. Pearson from California, and also living examples of the Coccoid *Phenacorus aceris*, on Spanish chestnut and beech at Oxshott.

May 12th.—Mr. Stanley Edwards, F.L.S., F.Z.S., Vice-President, in the Chair.—Mr. L. N. Stoniland, of Muswell Hill, was elected a member.—*Exhibition of "other orders."*—Prof. T. D. A. Cockerell exhibited numerous fossil insects from the Mid-Tertiary strata of the Isle of Wight with drawings of new species.—Mr. Lyle, a skein of silk wound from two cocoons of *Meteorus albitorquatus*, a hymenopterous parasite on *Bupalus piniiperda*.—Mr. Step, nests of *Sceliphron*, sp., the mud-dauber wasp from Calcutta.—Mr. S. R. Ashby, the collection of British earwigs, cockroaches, grasshoppers, locusts and crickets formed by the late Curator, Mr. W. West.—Mr. Withycombe, *Scorpio europeæ*, the young stage of *Mantis religiosa*, etc., received from Mr. Hugh Main in the South of France, and also

Sinodendron cylindricum (Col.) from a decaying beech in Epping Forest.—Mr. H. Moore, an exotic Homopteron, *Ptyelus flavescens*, from Nairobi, and also a specimen of *Gongylus gongyloides* from Ceylon.—Mr. O. R. Goodman, *Timarcha lavigata* (Col.), abundant at Horsley on May 8th.—Mr. B. S. Williams, *Orchestes salicis* (Col.), from willow at Finchley.—Mr. Coxhead, sketches of galls and their makers.—Mr. Turner, specimens of one of the largest dragon-flies, *Mecistogaster cæruleata*, from Central America.—Mr. Edwards, a collection of Central European Hymenoptera and Diptera.

May 26th.—Mr. Stanley Edwards, F.L.S., Vice-President, in the Chair.—Mr. G. T. Lyle, F.E.S., of Wallington, was elected a member.—Mr. Farmer exhibited a partly xanthic *Rumicia phœas* and a similarly coloured *Callophrys rubi*, both from Riddlesdown.—Mr. Neave, pupæ of *Strymon pruni* from N. Huntingdon.—Mr Simms, ova of *Cupido minimus* and the beetle *Cryptocephalus aureola* from Eastbourne.—Mr. Goodman, suffused forms of *Ematurga atomaria* from St. Martha's Hill, Guildford.—Mr. Bennett, the beetle *Hedobia imperialis* taken at Coulsdon.—In remarks on the season it was noted that *R. phœas* was very common, *Celastrina argiolus* was very scarce, and that *Eulype hastata* and *Hemaris fuciformis* were out at Horsley.

June 9th.—The President in the Chair.—Mr. A. A. W. Buckstone, series of *Colias croceus* (*edusa*) with extended black border of fore wings.—Dr. G. S. Robertson, ab. *cæca* of *Aphantopus hyperanthus* from the Lakes, forms of *Spilosoma menithastri* with spots tending to run together bred from Horsley, pale forms of *Tiliacea aurago* from Box Hill and dark ones from Torquay, and var. *lavateræ* of *Hesperia malvæ* from Bude, etc.—Mr. K. G. Blair, living specimens of the Phasmid *Bacillus gallicus*, young larvae of *Thais rumina* and *Papilio podalirius*, the asparagus beetle *Crioceris 12-punctata*, the pupæ of the glow-worm, and the females of *Epi. nopteryx*, sp., on the life-history of which he communicated notes.—Mr. O. R. Goodman, the melanic form of *Hemerophila abruptaria* taken near its original locality in N. London.—Mr. F. B. Carr, larvae of *Ptilophora plumigera*.—Mr. Enifer, cocoon and pupa of the ant-lion from S. France.—Mr. Grosvenor, a living specimen of *Trochilium crabroniformis* and a hybrid between *Zygæna trifolii* and *N. hippocrepidis*.

June 23rd.—The President in the Chair.—Exhibition of living objects.—Mr. H. Main, a number of objects obtained recently in S. France, including toads, crickets, centipedes, scorpions, spiders, trap-door spiders, earwigs, harvesting-ants, larvae of the ant-lion, of the *Ascalaphus*, of *Palpares*, etc.—Mr. Coxhead, galls in ash leaves of the Dipteron *Perrisia fraxini*.—Mr. Blair, the Phasmid *Corausius morosus* from India, the glow-worm *Lampyris lusitanica* from S. France, and the fire-fly *Photuris pennsylvanica* bred from larvae from U.S.A.—Mr. H. Moore, dipterous parasites from a pupa of *Sphinx ligustri*.—Mr. Enifer, larvae of *Coccinella bipunctata* and of an *Anthonomus* with the grain weevil *Calandra granaria*.—Mr. Withycombe, larvae of the scorpion-fly, etc.—Mr. Carr, larvae of *Bithys quercus*, *Xanthorhoe montanata*, *Tephrosia consonaria*, etc.—H. J. TURNER, Hon. Editor of Proceedings.

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PIERIS RAPÆ, GYNANDROUS AB.

By F. W. FROHAWK, F.E.S., M.B.O.U.

GYNANDROMORPHISM is of such exceedingly rare occurrence among the Pieridæ, especially as regards our three common species, *P. brassicæ*, *P. rapæ* and *P. napi*, that it is with pleasure I am able to give a figure of probably a unique gynandrous example of *P. rapæ*, now in the cabinet of Mr. Douglas C. Johnstone, to whom my thanks are due for the loan of the specimen for figuring. It was taken by the late Herbert Williams



on June 6th, 1891, at Boxhill, Surrey. As will be seen by the drawing, the left fore wing is wholly that of a normal male, and the costal areas of both the right fore and hind wings, as well as the costal spot on the latter, are of male colouring and marking; while the rest of the right wings and the whole of the left hind wing are of female colouring and markings. I know of no similar example of this species. The only gynandrous *P. brassicæ* known to me was a specimen taken many years ago by the late Mr. George Bryant, who sent it by post to the late Mr. Sidney Webb, but unfortunately it was smashed to fragments.

August, 1921.

NEW SPECIES OF NOCTUINÆ AND HYPENINÆ
FROM THE PHILIPPINES.

By A. E. WILEMAN AND RICHARD SOUTH.

Eucampima griseisigna, sp. n.

♂. Head, thorax and abdomen sooty brown; antennæ bipectinated, except at apex. Fore wings sooty brown; subbasal line blackish, slightly curved; antemedial and postmedial lines blackish; both are elbowed below the costa, the latter outwardly edged by a white line, which is crenulate at and below the elbow; subterminal line not clearly defined, but indicated by whitish dots between the veins; a greyish mark, formed of three spots, on dorsal area between the ante- and post-medial lines. Hind wings sooty brown, with three darker transverse bands, the middle one edged by an undulated white line, the outer one edged by whitish points. Underside similar to above but rather browner; a black discal spot, edged with whitish on hind wing.

Expanse, 30 mm.

Two males from Palali, subprov. Benguet, Luzon (2000 ft.), December 25th and 26th, 1912.

Sypna brevicauda, sp. n.

♀. Head and thorax dark brown, with reddish tinge; abdomen ochreous brown, darker dorsally. Fore wings ochreous brown, finely mottled with darker and sprinkled with black scales; antemedial line dark brown, almost blackish, slightly crenulate and curved, the basal area enclosed dark brown; medial line dark brown, almost straight from costa to dorsum, the internal area up to antemedial paler brown; postmedial line dark, sinuous, interrupted and indistinct, originating on costa in a geminate mark; subterminal blackish, oblique from costa near apex to vein 5, thence wavy and excurved, terminating at tornus; terminal area brown, slightly suffused with violet; whitish dots on costa towards apex, and a pale cloud towards costal end of the subterminal; terminal dots black, edged with white; fringes dark brown, crenulate, a pale line at their base. Hind wings ochreous brown, a blackish band before termen, its outer edge limited by the blackish subterminal line, which is indented below middle; discoidal mark blackish, with a dusky shade from it to dorsum; terminal lunules black, not continued towards costa, those nearest anal angle outwardly edged with whitish; fringes brown, crenulate, produced at vein 4. Underside of fore wings ochreous, irrorated with blackish on costal and terminal areas; two, outwardly oblique, black transverse lines, neither reaching dorsum, and a black cloud on terminal area above tornus; of hind wings ochreous, irrorated with black and traversed by two black, transverse lines, the first line angled at middle and the other wavy; a blackish band beyond the second transverse line, outer edge indented below middle.

Expanse, 50-58 mm.

Two females from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), one on November 9th, the other on December 13th, 1912. Another specimen of the same sex was taken at Manila, prov. Rizal, Luzon (sea level), August 2nd, 1912.

The Manila specimen only differs from the others in having the central area of fore wings faintly suffused with violet. The December female has been described.

Trigonodesma bimacula, sp. n.

♀. Head and thorax grey, reddish tinged, abdomen brownish grey. Fore wings grey, with a reddish tinge, two conspicuous chocolate-coloured spots on costa, the first somewhat triangular about middle, the second smaller before apex; transverse lines very indistinct, the antemedial commencing in a chocolate dot on costa; a chocolate dot below the first costal spot; dusty lunules on termen, fringes pale ochreous at base. Hind wings fuscous brown, fringes paler, inclining to ochreous at base. Underside brownish grey, a dusky postmedial line on all wings and a black discal dot on hind wings.

Expanse, 36 mm.

A female from Baguio, subprov. Benguet, Luzon (5000 ft.), June 22nd, 1912.

Nagia subterminalis, sp. n.

♀. Head and thorax brown, mixed with darker; abdomen greyish. Fore wings brown, suffused with darker and mottled with black; subbasal line pale brown, slightly oblique, edged with black; antemedial line black, waved, edged with pale brown; postmedial line black, edged with pale brown, outwardly oblique to cell around which it curves, thence inwardly oblique to dorsum; subterminal line ochreous, indented below costa, inwardly edged with pale brown about middle and followed by an interrupted black line; terminal line black, wavy; reniform stigma outlined in pale ochreous; fringes blackish, marked with pale brown below apex and about middle; each of these patches run through to subterminal line. Hind wings blackish, a white medial patch, with indications of extension to costa and dorsum. Underside of fore wings blackish, whitish towards base and on dorsal area; a white transverse band beyond middle, whitish marks on termen; basal half of hind wings whitish, outer half blackish, a blackish ring about middle, from which a line of the same colour runs to costa and a less distinct shade to dorsum; fringes as above.

Expanse, 44–50 mm.

Three females from Haight's Place, Pauai, subprov. Benguet Luzon (7000 ft.), November 8th and 30th and December 3rd, 1912.

Hypena luzonensis, sp. n.

♂. Fore wings ashy-grey with a large blackish brown patch on costa, which extends almost to dorsum and projects outwards to the apical streak, where it terminates in a point. Except on the costa this

patch is edged with white and encloses two black marks, one punctiform, the other linear. Hind wings fuscous with black discal dot. Under-side fuscous, marking of fore wings showing a black discal dot and line beyond on the hind wings.

Expanse, 40 mm.

A male specimen from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), November 10th, 1912.

Near *H. rhombalis*, Guenée.

Hypena nebulosa, sp. n.

♂. Head thorax and abdomen dark brown; palpi dark brown, very long. Fore wings brown clouded with darker on costal area, irrorated with black, sprinkled with greyish on middle of disc; a greyish apical streak; postmedial and subterminal lines dark brown, both bent outward above middle. Hind wings dark fuscous, fringes greyish at tips. Underside fuscous, costa of fore wings greyish flecked with fuscous; hind wings with a black discal dot and broad dark band beyond.

♀. Very similar, but the brown coloration is redder in tint, greyish is rather more prominent on discal area and the greyish mark at apex is broader; hind wings rather paler than in the male.

Expanse, 40 mm.

Three males and two females from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), November, 1912.

Allied to *H. longipennis*, Walker.

Hypena variegata, sp. n.

♀. Palpi, head and thorax dark brown; abdomen paler brown. Fore wings brown with paler shades on outer third; subbasal line black, short; antemedial line black, slightly sinuous, internally edged with pale brown and preceded by two black marks about middle; postmedial line black, rather sinuous, outwardly edged with pale brown, followed by a sinuous blackish shade-like line extending from costa almost to dorsum; subterminal line black, sinuous, broken up into dots towards dorsum; space between the postmedial and subterminal lines pale brown; an, almost quadrate, pale brown patch on costal area between subterminal line and termen; pale brown dots on costa between postmedial and apex; black dots inwardly edged with pale brown on terminal ends of the veins; discoidal marks black, obscurely edged with pale brown. Hind wings dark fuscous, discal dot and line beyond black, the latter edged with pale brown. Underside pale brown, suffused with blackish on the fore wings and stippled with the same on the hind wings; two white dots below costa towards apex on fore wings and a dark brown discal dot and curved line on hind wings.

Expanse, 39 mm.

A female specimen from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), November 9th, 1912.

Belongs to the *obsitalis* group of *Hypena*. There are three unnamed specimens from Ceylon in the B.M. Collection.

Hypena (?) albipicta, sp. n.

♂. Head, thorax and abdomen blackish brown, the latter with darker tufts. Fore wings blackish brown, a white dot in cell and a white sinuous postmedial line; the antemedial and subterminal lines are whitish with dark edges; both are sinuous, but not well defined. Hind wings dark fuscous. All wings have a pale terminal line preceded by black dots; fringes of fore wings freckled with white at apex. Underside fuscous grey; the fore wings with medial and postmedial dusky lines, the latter marked with white on costa; hind wings have a black, discal mark and two blackish lines beyond, the outer line broad, diffuse and interrupted.

Expanse, 31 mm.

A male specimen from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), January 12th, 1912.

Pseudaglossa (?) basalis, sp. n.

♂. Antennæ knotted below middle; head, thorax and abdomen chocolate brown, basal third ochreous brown clouded with darker; antemedial line ochreous brown, almost straight, but slightly indented near costa; postmedial line ochreous brown, inwardly edged with blackish, sinuous to middle, thence crenulate to dorsum; subterminal line pale brown, crenulate; orbicular stigma ochreous, punctiform; reniform stigma outlined in ochreous, enclosing a chocolate-brown lunule; terminal dots black, inwardly edged with ochreous; fringes of the ground-colour traversed by a faint greyish line. Hind wings fuscous on basal two-thirds, paler on outer third; basal area limited by a dusky line, outer area traversed by a dusky, diffused band; terminal line black, interrupted towards costa; fringes fuscous. Underside of fore wings with two ill-defined ochreous lines on outer third, the first curved, the other nearly straight but interrupted; terminal dots as above, without ochreous edge; hind wings ochreous, heavily freckled with fuscous, discal mark black, a sinuous blackish line beyond; terminal dots black, preceded by an interrupted ochreous line.

♀. Agrees with the male except that the reniform stigma is entirely white and the hind wings are dark fuscous, almost blackish on basal area.

Expanse, 40 mm.

One male and three female specimens from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), taken in 1912—the male on November 7th, the females November 16th and 23rd and December 11th. One ♀ (November 16th) has the reniform stigma as in the male described.

A NEW FORM OF *TAJURIA* (LEP. RHOP.) FROM
CEYLON.

By N. D. RILEY.

Tajuria jehana ceylanica, ssp. nov.

♂. Differs from typical *jehana* in the greater extent of the blue area on the fore wing above. In typical *jehana* this extends from inner margin to vein 2, and, in the cell, from the base to just beyond vein 2. In *ceylanica* it extends in the cell to beyond vein 3 and from the inner margin to vein 3, with a few scattered blue scales in area 3, and approaches the hind margin more closely as well. On the hind wing the black marginal spots in areas 1c and 2 are slightly reduced in size. This latter feature also applies to the under-side, which otherwise presents no conspicuous difference.

♀. The differences are of a similar nature. The blue is of a more silvery shade on both wings. It occupies the whole of the cell with the exception of the anterior distal quarter, extends from inner margin to just over vein 4, and its outer margin runs very evenly and almost parallel, but not very close to the hind margin. On the hind wing the marginal spots are as in the male, the discal wavy dark line very narrow. On the under-side this line is continued rather conspicuously (for this species) on the fore wing.

Length of fore wing: ♂, 14 mm. (16 mm. in ♂ type of *jehana*) ; ♀, 15·5 mm. (the same as in the ♀ type of *jehana*).

B.M. Type No. Rh. 190, ♂ ; 191, ♀, Kankasanturai, Ceylon, W. Ormiston.

The species appears to be very rare in Ceylon, there being in the British Museum only, in addition to the types, 1 ♂, 1 ♀, obtained by Mr. Fairlie, who first discovered the species in Ceylon, and 1 ♂ from Mr. E. E. Green. It differs quite constantly from the continental Indian specimens in the British Museum.

THE MACRO-LEPIDOPTERA OF COUNTY TYRONE.

By THOMAS GREER.

(Continued from p. 116.)

Hypeninae.

Zanclognatha tarsipennalis, Tr.—Not uncommon locally; near Killymoon, at Stewartstown, and Tamnamore.

Zanclognatha grisalis, Hb.—Fairly abundant and widely distributed; near Cookstown (H.), at Killymoon, also at Stewartstown and Tamnamore.

Hypena proboscidalis, L.—Abundant almost everywhere among nettles.

GEOMETRIDÆ.

Geometrinæ.

Pseudoterpnæ pruinata, Hufn.—Locally abundant among broom and gorse.

**Geometra papilionaria*, L.—Local but widely spread; near Lissan, in lanes near Cookstown (H.), in birch woods at Killymoon, and in alder swamps near Stewartstown.

**Geometra vernaria*, Hb.—Taken in some numbers by Messrs. J. S. Wilson and G. Coulter near Coalisland ('Entom.', vol. I, p. 237, and vol. li, p. 187); no doubt introduced at some time with *Clematis vitalba*, which is common in gardens in the locality.

Iodis lacteria, L.—Locally abundant in woodlands.

Acidaliaiinæ.

**Acidalia (Ptychopoda) inornata*, Haw.—Not uncommon among heathier and birch scrub, at Tamnamore.

Acidalia (P.) aversata, Hb.—Generally abundant; var. *spoliata*, Staud., at Lissan and Tamnamore.

Acidalia (P.) bisetata, Hufn.—Abundant and widely distributed; var. *fimbriolata*, Step., not uncommon near Cookstown (H.) and Lissan.

Acidalia (P.) dimidiata, Hufn.—Common locally.

Ephyra pendularia, Clerck.—Kane found this species fairly abundant at Favour Royal and Altadiawan; it is (or was before the birch woods were felled) not uncommon at Killymoon.

HYDRIOMENIDÆ.

Ortholitha plumbaria, Fb.—Abundant generally among gorse and broom.

Ortholitha limitata, Scop.—A common species in rough meadows.

**Odezia atrata*, L.—Locally abundant in meadows at Lissan, and near Stewartstown.

Anaitis plagiata, L.—Locally not uncommon and widely spread; in woodlands resting on tree trunks, and on moorlands on the rocks.

**Chesias spartiata*, Fues.—A common species among broom, *Cytisus scoparius*.

Lobophora (Trichopteryx) carpinata, Bork.—Fairly abundant at Favour Royal and Altadiawan (K.); near Lissan and at Killymoon, where banded forms approaching ab. *fusciata*, Prout., occur.

Lobophora (T.) viretata, Hb.—Not uncommon among hollies at Lissan; Altadiawan, one example (M.F.), *vide* Kane.

Lobophora halterata, Hufn.—Local and not abundant; a few at Favour Royal (K.); larvæ beaten from sallow near Cookstown (H.).

**Lobophora sexalista*, Hb.—Very rare among sallows near Stewartstown.

Chæmatobia brumata, L.—Very abundant.

**Triphosa dubitata*, L.—Rare at ragwort blossom in September near Stewartstown.

**Eucosmia undulata*, L.—Very rare near Lissan.

Eustroma silaceata, Hb.—Locally abundant at Favour Royal (K.) ; also at Lissan, Killymoon and near Stewartstown.

**Lygris prunata*, L.—Abundant in gardens at Stewartstown ; not uncommon in woods at Loughry, and Killymoon ; also near Grange.

Lygris testata, L.—Abundant and wide-spread on the mountains, bogs and marshes ; in the local form the males are mostly purple and the females yellow.

Lygris populata, L.—Very common in similar localities to the last species and also in woodlands ; a form near var. *musauria*, For., at Lough Fea.

**Cidaria pyraliata*, Hb.—Abundant and widely spread in the district.

Cidaria fulvata, Forsk.—Not uncommon locally at Favour Royal (K.) ; near Lissan and Stewartstown ; a few near Cookstown (H.).

Cidaria corylata, Thun.—Abundant at Favour Royal (K.) ; not uncommon at Lissan and near Cookstown.

Cidaria truncata, Hufn.—Abundant in May and June and again in September ; vars. *comma-notata* and *perfusata*, Haw., not uncommon ; in several of the former the yellow colour does not extend to the costa, which is dark, as also the base and outer margin of fore wings.

Cidaria immanata, Haw.—A most abundant species and very variable ; handsome forms of *marmorata*, Haw., are common ; one example approaching var. *thingvallata*, Staud., but with a small spot of white in the black median band, near Lough Fea.

Cidaria siterata, Hufn.—Usually abundant ; the females of a rich dark green suffused with rose colour.

Cidaria miata, L.—Common, but rarer than the preceding species.

Thera obeliscata, Hb.—Locally abundant in pine woods ; the black form, var. *obliterata*, at Killycolpy Wood, Lough Neagh.

Lampropteryx suffumata, Hb.—Abundant and widely distributed ; dark forms approaching ab. *piceata*, Step., at Lough Fea.

Coremia (Ochyria) munitata, Hb.—Locally abundant and wide-spread, occurring at Lough Neagh (60 ft.) as well as on the mountains at 2000 ft. in the Sperrin range ; also at Favour Royal and Altadiawan (K.), near Lissan, Lough Fea and at Stewartstown.

Coremia (O.) unidentaria, Haw.—Abundant in damp localities ; red and dark purple banded forms.

(To be continued.)

OXIGRAPHA LITERANA, L.: ITS LIFE-CYCLE,
DISTRIBUTION, AND VARIATION.

By W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 190.)

Ab. *suavana*, Herrich Schäffer.

Synonymy.—*Suarana*, Herr. Schäff., Schmett. von Eur., iv, p. 152, and Tort., plate i, fig. 1 (1849); Staudinger, Cat. Pal. Lep., ii, p. 82, No. 1458 (1901); Spuler, Schmett. Eur., p. 242 (1908); Kennel, Pal. Tort., p. 83 (1908); Wagner, Lep. Cat., par. x, p. 69 (1912).

Original description (*Tort. suavana*, Herr. Schäff., ‘Schmett. von Eur.’, iv, p. 152, and ‘Tort.’, pl. i, fig. i [1849]).—Laete viridis, albido mixta, undulis transversis nigerrimis; linea limbali tota et ciliarum dimidos basali in costis nigris.

I have not seen a British specimen which quite agrees with Herrich Schäffer’s figure or description. I have several from the New Forest which come pretty near to them, but they have not the “whitish” blotches of the type.

Ab. *nigromaculana*, n. ab. (Plate I, fig. 6.)

I cannot find that this form has been noticed by any author who has written upon *literana*. I describe it as follows: Superiors of the deep green colour, and with the black dotting of ab. *squamana*, with the addition of several large and prominent blotches; these are not so clearly and sharply defined as in *literana*, type: there is one in the inner margin of the base, one near the centre of the disc, and a third on the costa; the positions of these blotches is best understood by reference to the plate. The aberration is exactly similar to ab. *fulvomixtana*, Steph., with the exception that it is without the fulvous blotches. My specimens, six in number, came from the New Forest. I have not seen examples from another locality.

Ab. *fulvomixtana*, Stephs.

Synonymy.—*Fulvomixtana*, Stephs., Cat., ii, p. 188, No. 7098 (1829); Stephs., Haust., iv, p. 166 (1834); Curtis, Guide, p. 173 (1829); Rennie, Conspect., p. 180 (1832); Curtis, Brit. Ent., p. 440, No. 5 (1833); Wood, Index Ent., fig. 1102 (1839); Westwood, Brit. Moths, pl. 96, and p. 165 (1845); Staudinger, Cat. Lep. Eur., p. 234 (1871); Snellen, Vlinders, p. 176, No. 8 (1882); Staudgr., Cat. Pal. Lep., ii, p. 82 (1901); Spuler, Schmett Eur., p. 242 (1908); Wagner, Lep. Cat., par. x, p. 69 (1912).

Original description (*Leptogramma fulvomixtana*, Stephs.).—“Anterior wings rough, of a light green, the disc with darker clouds, irregularly mixed with fulvous and black ones; in general

there is a conspicuous black spot at the base of the inner margin, and another on the costa towards the apex, with smaller ones on the disc, more or less distinctly mixed up with the fulvous clouds or spots; posterior wings brownish." "Some examples are destitute of the black clouds, and are only adorned with pale fulvescent spots on a green ground."

Stephens first named this aberration in his 'Catalogue' in 1829, but did not describe it until 1834 in 'Hanstellata,' iv, p. 166. The examples which he describes as "destitute of black clouds" refer to the next aberration. The type-specimen, which was figured by Wood, fig. 1102, is now in the National Collection, and it agrees well with Stephens's description: Ab. *fulvomixtana* is not by any means a common form. I have obtained only three examples out of many hundreds examined: these came from the New Forest.

Ab. *aerugana*, Hübn.

Synonymy.—Hübn., Tort., fig. 92 (1797) (named *squamulana*); Hübn., Verz., p. 386, No. 3750 (1826); Westwood, Brit. Moths, pl. 96, figs. 11 (*squamana*) and 14 (*fulvomixtana*) (1845); Kennel, Pal. Tort., taf. 5, fig. 2, and p. 83 (*squamana*) (1908).

Ab. *aerugana* was first figured by Hübner in 1797, 'Tort.,' fig. 92, but named (with figs. 93, 94 and 95) *squamulana*. In 'Verzeichniss' (1926) he names fig. 92, 'Tort.,' *aerugana*.

Fig. 92 is a very good one and is unmistakable. It portrays a form with the green colour of ab. *squamana*, mixed with darker cloudings, fulvous blotches and black dots. The basal fascia and central group of lines which are found in *literana* type are somewhat lightly indicated, but are apparent.

I have eighteen examples from the New Forest which agree with Hübner's figure with the exception that the black lines are not so strongly indicated, and in some instances require the aid of a magnifying glass to detect. I have no doubt but that this is the form which Stephens describes with ab. *fulvomixtana* as—"some examples are destitute of the black clouds, and are only adorned with pale fulvescent spots on a green ground." The majority of my specimens would agree with this description, unless examined very critically with a magnifying glass.

NOTES ON THE OCCURRENCE OF *ANOSIA PLEXIPUS* IN ENGLAND.

BY PAYMASTER-IN-CHIEF GERVASE F. MATHEW, R.N., F.L.S.,
F.E.S.

MR. FROHAWK'S notes on this species in the 'Entomologist' for last month, pp. 145-6, has recalled to my mind what I believe to have been a view of this butterfly actually arriving in

England. I made a note of it at the time in my journal, but did not send it for publication, as I did not feel quite positive. However, I think there can be little doubt about it. I have seen this fine butterfly so many times flying over and about ships I have been on in the Pacific, North American, Australian and other stations, also in their native haunts on shore, where, in some places, they were exceedingly plentiful, so it is not likely I could have been mistaken. It is a strong flier and as a rule flies high. When flying about a ship it generally keeps up aloft among the spars and rigging, where I have sometimes seen them settling down for the night. On shore I have seen them congregating in hundreds towards sunset, and taking up their quarters on the under-sides of drooping branches of forest trees and usually pretty high up.

The following is an extract from my journal of October 1st, 1917, while I was living at Instow, North Devon: "Saw what I think may have been *A. plexippus*—a very large butterfly which came flying in from the sea—flapping along and soaring. It passed some fifty yards on one side of me at a height of about a hundred feet, so I could not make out its markings very distinctly, but it was a big, dark-looking butterfly, and if not *plexippus* I do not know what it could have been." It was a lovely bright day with a very light N.E. breeze and I was in a marshy field near the beach, and the butterfly came straight in from the direction of Barnstaple Bar and the Bristol Channel.

Of the few examples of this species which have been taken in England I had the pleasure of seeing one alive. It was in September, 1885, while I was at Devonport paying off in H.M.S. "Espiegle" after a four years' commission on the Australian station. On the evening of the 24th of that month I accompanied my old friend, the late G. C. Bignell, to the house of Mr. F. F. Freeman, on the Hoe, to look at his collection of European Rhopalocera. While we were there we discussed, among other things, the occurrence of *plexippus* on several occasions of late years in this country, and wondered how it managed to cross the Atlantic. The next day Mr. Freeman came to Devonport to see me and brought with him a living specimen of *plexippus*, which he had captured that morning in a street near the Hoe! Of course I was very pleased to see it, and thought it rather a curious coincidence after our conversation on the previous evening. It was a fine large example and in good condition. The only record I can find of this capture is a brief notice in the 'Proceedings of the Entomological Society' for October 7th, 1885, where it states that "Mr. F. F. Freeman sent a communication recording the recent capture of a specimen of *Danais archippus*, Fabr., at Plymouth."

Dovercourt, Essex;
June 14th, 1921.

NOTES ON BRITISH NEUROPTERA IN 1920.

By W. J. LUCAS, B.A., F.E.S.

ALDER-FLIES.—*Sialis lutaria*, Linn. was taken in the New Forest on 11 and 21 May (Lucas). *S. fuliginosa*, Pict., which is usually considered to be somewhat later than its congener, was taken there on 13 May, and on 24 May was not infrequent in Dames Slough Inclosure. Both species occur together at Blackwater in the New Forest; in Yorkshire, however, *S. fuliginosa* occurs about rapid streams, whereas *S. lutaria* favours ponds and slow-flowing rivers (Porritt). *S. fuliginosa* was taken at Camberley in Surrey on 6 June (Green).

SNAKE-FLIES.—At Esher Common, Surrey on 7 August a larva of *Raphidia* (probably *R. maculicollis*, Steph.) was found some five or six feet above the ground, under the bark of a dead but standing Scotch Fir, on which the bark was dry. The larva, therefore, does not require a damp situation. If the species was *maculicollis* it must by appearance have been full grown or nearly so.

BROWN LACE-WINGS.—On 21 May I captured two examples of *Osmylus chrysops*, Linn. at Blackwater in Dames Slough Inclosure, while on 24 May this insect was very frequent at Blackwater in the same inclosure. Sometimes the wings were glossy, so presumably they had but recently emerged. This species, although far the largest of our Hemerobiids, has but a feeble flight, not long sustained. On tapping a bush (Rose if I recollect rightly) overhanging the stream quite a number would take to flight; but they quickly settled down again close by. At rest they carry their wings after the manner of *Hemerobius*. They have quite the appearance of an ant-lion, resembling *Palpare libelluloides*, Linn. in miniature. My last sight of the species was on 4 July, at Hurst Hill, also in the New Forest. C. L. Withycombe took one on 24 May at Sevenoaks and several others at a later date. *Hemerobius elegans*, Steph. was taken at Epping Forest—six on 21 July and two on 20 August (Withycombe). Of *H. micans*, Oliv., one was captured on the wing in poor weather at Dunley Hill, Surrey, on 6 June (Lucas); E. E. Green took it on 7 May at Camberley and a small female example in very teneral condition was taken in the New Forest on 28 August. It had a ruddy head with black eyes, pale yellow thorax, and very pale abdomen with black appendages (Lucas). *H. humuli*, Linn. was met with on 5 June at Harpenden, Herts, and on 7 May at Camberley (Green). *H. subnebulosus*, Steph. was found at Camberley on 8 May and 8 June (Green); *H. stigma*, Steph. in the same locality on 11, 12, and 19 July (Green); and *H. quadrisfasciatus*, Reuter, there also on 31 May (Green). In the Epping Forest District Withycombe took *H.*

micans, *H. humuli* (not common), *H. lutescens*, Fabr., *H. subnebulosus*, *H. stigma*, and *H. concinnus*, Steph. He also found two *Micromus paganus*, Linn. in June at Walthamstow, Essex.

GREEN LACE-WINGS.—The following were met with in 1920: *Chrysopa rittata*, Wesm., 12 June, near Horsley, Surrey (S. London Ent. Soc. Excursion), and Stanmore Common, Middlesex, on 3 June (Lucas); *C. flava*, Scop. expanding its wings on herbage by the side of a pond on Epsom Common, Surrey, on 11 June, and a rather small example at Esher Common on 15 July (Lucas); *C. alba*, Linn. on 19 and 29 May in the New Forest, and on 3 June at Stanmore Common (Lucas), also near Horsley on 12 June (S. Lond. Excur.); *C. tenella*, Sch. one on 27 May in the New Forest somewhat teneral and not fully coloured (Lucas); *C. prasina*, Ramb. on 21, 23 and 28 June, and 5 July in New Forest, near Claygate, Surrey, on 15 July (Lucas). *C. perla*, Linn. near Horsley on 12 June (S. Lond. Excur.), New Forest 24 June (Lucas), Byfleet Canal, Surrey, on 24 July (S. Lond. Excur.). Withycombe tells me that in the Epping Forest District *C. flava*, *C. alba*, *C. tenella*, *C. septempunctata*, Wesm. and *C. perla* were found from June (or end of May) on till July and August. *C. flava* and *C. perla*, however, were as usual over by the beginning of August. On 29 November he took the winter form (*carnea*, Steph.) of *C. vulgaris*, Sch. in a garden at Walthamstow.

SCORPION-FLIES.—The first seen was a specimen of *Panorpa germanica*, Linn. at Horsley on 26 April. *P. communis*, Linn. was captured on 8 May in the Roy. Hort. Soc. Gardens at Wisley. A male of the same species was found on 22 May and a female on 29 May in the New Forest, while in the same locality females of *P. germanica* were met with on 26 and 27 May. On 3 June at Stanmore Common both species were taken. On 9 June Panorpas were numerous near Horsley and both species were taken, as also they were on 12 June (S. Lond. Excur.), but the latter were more frequent. From 18 June till 8 July both species seemed common in the New Forest. In fact on the dull threatening morning of 4 July Dr. Tillyard and myself found both species very numerous at Hurst Hill, especially on the bracken fronds: most were males. Two females of *P. communis* were taken at Byfleet Canal (S. Lond. Excur.) on 24 July, and a male *P. germanica* was captured at Harelane, Surrey, on 16 August (Lucas).

28, Knight's Park,
Kingston-on-Thames.
June 1st, 1921.

SOUTH AMERICAN EUMOLPIDÆ, MOSTLY OF THE GROUP COLASPINI.

By FRED. C. BOWDITCH.

(Continued from p. 195.)

Agbalus viridis, sp. nov.

Medium sized. Below, rather dark, blackish green; above, shining, æneous green metallic; thorax narrow in front, minutely punctured; elytra elongate, closely punctate in regular striæ; ♂ with a thorn-like prolongation near the apex of the hind femora.

Type, 3 ♂, ♀, Costa Rica (Bolley).

Length, 5 mm.

Head with a few fine punctures, and with the ordinary transverse and longitudinal grooves; labrum fulvous; antenna with four or five basal joints fulvous, remainder dark; thorax strongly narrowed in front, sides feebly rounded and narrowly margined (like *chiriquensis*, Jac.); surface finely punctured; elytra elongate, with shallow transverse depression, closely and strongly striate punctate, coarser at the base and sides; legs with tibia and tarsi more or less rufescent.

This form is nearly related to *chiriquensis*, Jac., and of the same narrow elongate shape, and forms the northern representative of the group composed of *subcostatus*, Jac., and *bolivianus*, Jac. This last species is described by Mr. Jacoby, as above, metallic greenish, and with fulvous legs. Forms occur with legs nearly dark, and also with the upper surface blue or purple, all from the same locality; I regard them all as varieties of *bolivianus*.

Alethaxius carinipennis, sp. nov.

Size large, elongate, parallel. ♀ broadened; in ♂ dark, shining, metallic æneous green; head coarsely, aciculate punctate, sparse at the vertex; thorax rather sparsely punctured, with large and small punctures mixed; elytra strongly, almost regularly seriate punctate, the humeral interval in the ♂ developing into a strong carina, extending from almost the middle nearly to the apex; ♀ has this carina replaced by a more or less double row of strong rugosities, which begin with the shoulder and extend to the apical third; legs rufous, more or less cyaneous.

Type, 3 ♂, 2 ♀, Equateur.

Length, 5·5-7 mm.

The head has a deep triangular fovea on the front, between the eyes; apex pointing backwards, the sides forming a fairly well-defined carina, running to the base of the antennæ; the labrum is rufous cyaneous. Antennæ extend to the middle of the elytra, dark, with the lower joints more or less rufous, scarcely thickened at the end; thorax wide, strongly margined, and bisinuate at the middle; the punctuation is rather sparser and

finer at the base and middle than the sides ; the elytra have a distinct though short depression, better defined in the ♀ than ♂ ; the carina in the latter gives the elytra a broad appearance, which is lacking in the other sex, and the punctuation is, as in many cases, very fine at the apex ; in the ♂ the body below is dull bluish black, sometimes tinged with metallic ; the ♀ with the last abdominal segment compressed into a short carina ; the legs vary from rufous more or less coloured with cyaneous blue to nearly dull cyaneous bluish.

The ♀ is shaped very much like the ♀ of *variabilis*, Jac., except the antennæ are not as short. The specimen upon which the small measure is based is a ♂ and almost wholly cyaneous blue below, and the carina is well marked almost to the shoulder, otherwise it seems the same.

There are certain forms from Cachabè which I had originally separated as distinct, on account of the smaller size (5 mm.), less carinate elytra, which gives a somewhat different form, but for the present I put them all together.

Alethaxius ænea, sp. nov.

Size of *variabilis*, Jac. ; elongate, parallel. Body below shining æneous, last abdominal segment rufous ; above, shining, æneous bronze ; head and thorax very lightly and finely punctate ; elytra lightly punctate striate, the humeral interval obsoletely carinate for the middle two-thirds of its length ; legs rufous, the base and apex of femora brown, and tibia and tarsi more or less shaded with cyaneous brown.

Type, ♂, Cachabè, low c., November, 1896 (Rosenberg).

Length, 6·5 mm.

Labrum and palpi yellow, jaws large and black, antennæ slender, half the length of the body, yellow, most of the joints partly infuscate ; head convex, remotely punctate, thickly on the epistome, deeply transversely depressed, and with a longitudinal sulcation running nearly to the back edge, but not very deep ; thorax convex, distinctly collared in front, and with a small wide fovea each side on the disc back of the middle ; all the angles prominent, sides strongly bisinuate, elytra noticeably transversely depressed, with somewhat raised scutellar area ; the striate punctuation fine, but distinct to apex ; ♀ unknown. The smooth appearing bronze surface at once distinguishes this form.

Alethaxius pallida, sp. nov.

Elongate, parallel, shining, entirely castaneous yellow, or light brown ; the apical joints of the antennæ and jaws a little darker, eyes black ; head and thorax sparsely, finely and very remotely punctulate ; elytra finely striate punctate, the intervals faintly raised at the apex.

Type, 2 ♂, Cachabè, low c., August, 1897 (Rosenberg).

Length, 4 mm.

Head with usual transverse depression, and a small fovea in place of the longitudinal sulcation; antennæ long and slender, reaching below the middle of the elytra; the sides of the thorax margined and bisinuate at the middle; transverse depression of the elytra fairly well marked. Easily distinguished by the shape and light colour. Judging from the description these three forms seem allied to *nigritarsis*, Jac., which I have not seen.

Rhabdopterus, Lef.

The history of *R. piceipes*, Oliv., has been reviewed by Dr. Horn in 'Trans. Am. Ent. Soc.', vol. xix, p. 226; the species was described originally as coming from Carolina. I have a series of specimens marked "Louisiana, A. Salle," the ♀'s of which I find very difficult to reconcile with Dr. Horn's description. They agree a good deal better with the original description of *piceipes* than they do with Say's description of *prætaxta*. This, however, is only a suggestion, but I wish Dr. Horn had seen my specimens.

Mr. Jacoby, in his paper on the Coleoptera of St. Vincent, in 'Trans. Ent. Soc. London,' 1897, p. 257, gives *piceipes* as one of the list. In his second collection, part of which is in my possession, these St. Vincent specimens are named (his original label) *piceipes*, Oliv. ?; it is evidently a different species from our form, there is no sinuation to the hind tibia of the ♂ and the size is greater—I call it *grenadensis*. Mr. Blatchley has sent from Dunedin, Florida, ten or a dozen specimens as *piceipes*, which are evidently not, as the hind tibia of the ♂ is strongly dilated at its apical half, and the form is larger and stouter. I call it *blatchleyi*.

(To be continued.)

NOTES AND OBSERVATIONS.

WATSON'S "SPEERA" BINOCULAR MAGNIFIER.—Messrs. W. Watson & Sons, Ltd., of 313, High Holborn, have recently brought out a new magnifier, which will be of great assistance to entomologists in dealing with small insects. There have been various devices invented in the past for this purpose, but the one I am discussing is far in advance of any I have seen for utility in pinning and setting small insects. It consists of a pair of binocular achromatic lenses, mounted in spectacle frames, and set at such an angle to each other that the vision converges on the focal point. The magnifiers are made in three powers, the focal lengths of the pair of lenses being 5, 7 and 10 in., giving magnifications of 3·5, 2·5 and 1·75 diameters respectively. The cost is £2 per pair. The great advantages about the magnifiers are that they leave both hands free, they suit all sights, and if higher magnification is required, this can be obtained by holding an ordinary lens in the hand at focal distance from the object looked at. Anyone wishing to avail themselves of

this invention should write to Messrs. Watson for a descriptive and illustrated circular which they issue.—W. G. SHELDON.

REARING THE LARVÆ OF MELITÆA CINXIA.—In reading "Notes on Lepidoptera at Alton," contributed by Mr. E. A. C. Stowell and published in the 'Entomologist' for May, I was struck by his observation that he found *cinxia* larvæ very hard to rear, and only bred eight imagines from about thirty-six larvæ. Is the successful rearing of this species dependent upon climatic conditions? That kind friend and enthusiast, the late General Grant, when residing in the Isle of Wight, sent me batches of larvæ on several different occasions, and I never had the slightest trouble in rearing them in Devon. Though I did not actually count the larvæ received, some of which were often quite small, so far as I am aware none of them died. My method of treatment was simple. I got an ordinary hat-box; I took the top out of the lid and put in its place a piece of net to allow the free admission of air and sun. The box was placed in front of a south window, or in an unheated greenhouse, with all doors and windows open, and tilted forward so as to get all the sunshine possible. To feed the larvæ I placed a layer of quite small plants of the narrow-leaved plantain at the bottom of the box. I obtained these from a weedy lawn by cutting them off with an old knife about an inch below the surface of the ground. I never used the large, rank plants that are to be found in meadows and by the roadside. Early every morning I placed a fresh supply of these little plantains on the top of the food already there, much of which was, of course, withered up. I removed from time to time dead bits and débris, but never turned the box out, and took great care not to disturb any larvæ that might be changing. The food, given fresh daily, was generally damp with dew. Treated thus, my *cinxia* larvæ appeared to thrive admirably. They duly pupated, but the boxes were not moved until the imagines emerged. Of the large number bred I have only had one really nice variety. The required treatment seems so simple that I am forced to the conclusion that climatic conditions are the essential factor in rearing the larvæ of *M. cinxia*.
—C. M. MAYOR; Bank House, Dawlish, S. Devon.

THE ADAPTATION OF CATERPILLARS TO THEIR SURROUNDINGS.—Last season a wild *B. gemmaria* female in my possession laid a batch of ova which hatched in due course. I placed the young caterpillars in metal and cardboard glass-topped boxes. When the time came to transfer them to a breeding-cage I was surprised to find that in each case the caterpillars had as nearly as possible assumed the coloration of their surroundings—that is to say, that those in the cardboard box (which of course had white sides) were of a very light brown colour, those in the metal boxes very much darker, while those that had been in a metal box the sides of which were considerably discoloured were almost black. When hatched the whole brood were of the usual reddish-brown colour of this species, and all have been fed throughout on privet. It would be interesting to know what effect, if any, this question of larval environment has on the perfect insect.—N. O. R. SERJEANT; Eardiston, Barnet Wood Lane, Ashtead, Surrey.

NOTES ON PUPATION OF *NONAGRIA TYPHE*.—During autumn I generally collect many pupæ of *Nonagria typhæ*, Esp., and perhaps two occurrences which came under my notice in 1920 may be of interest. Up to the autumn of that year I always imagined that this moth emerged from a pupa which lay in the bulrush with its head pointing downwards, and that the hole from which in due course the moth would emerge was beneath the pupa and entirely open when the outside leaves were stripped away. Amongst several pupæ taken in the Churnet Valley in the autumn of 1920 was one which had pupated head upwards with the emergence hole consequently above it. Another curious fact was that the hole itself was not gnawed through the reed-stem, but covering it was the outer skin of the stem, resembling somewhat the mode of pupation of *N. geminipuncta*, Hatch. The resulting moth was a typical *N. typhæ*, although it did not emerge until October 31st, a fortnight later than the last of my other pupæ taken at the same time. Another occurrence of interest was that of two *N. typhæ* pupæ which were found in the same stem. In this case the larvae had both pupated normally with their heads pointing downwards and within an inch of each other. The path of the upper pupa was completely obstructed by the pupa below, and it is difficult to see how the moth of the former could have got away from the stem had the lower pupa still been intact. The process of emergence would have been a very difficult matter in the wild state in any case, and had I not removed most of the pupæ from the rushes possibly the occurrence would have been undetected.—THOMAS SMITH; Whiston Eaves, Froghall, Staffordshire.

SECOND BROOD OF *NISONIADES (THANOAS) TAGES*.—While at Swanage, Dorset, on July 20th and 24th, I captured two male specimens of *Thanoas tages*, and again on August 9th at Hockley, Essex, I took another male example in good condition. All three specimens are more distinctly spotted with cream colour than any of those of the normal spring brood in my series. The submarginal row of cream spots in both the fore and hind wings are very conspicuous, giving the specimens a banded effect. The whole colouring has a more ochreous appearance. A second emergence of this species is quite exceptional, and due to unusually fine warm summers as that of 1893 and the present season.—F. W. FROHAWK; August, 1921.

NISONIADES TAGES, LINN.—On July 26th last I saw a Dingy Skipper in the New Forest. As I examined it at close quarters it seemed to be in good condition, and I have no doubt it belonged to a second brood.—W. J. LUCAS.

EMERGENCE OF *HESPERIA MALVAE*.—With reference to the above (*antea*, p. 195), I am surprised that over such a long period of years Mr. Raynor did not come across a specimen earlier than May 5th. I have not kept records, but the specimens in my cabinet are dated April 27th and 28th, 1912, May 13th and 25th, 1913, and April 25th, 1914. These specimens were all taken on chalk hills in Kent. Although I cannot turn up any dates, I have no doubt that in certain

years this insect is double brooded.—FREDERICK GILLETT; Cheriton House, Sevenoaks, Kent.

APORIA CRATEGI, L., IN CYPRUS.—On June 28th I took three males of this species, and a fourth male on July 2nd near Platres, on the southern range of mountains. Dr. Guillemard reported this species from the island in 1887, but it has apparently never been taken since, and was considered a doubtful species (*vide* "The Butterflies of Cyprus," by Hy. J. Turner, F.E.S., 'Trans. Entom. Soc. Lond.', July 26th, 1920, etc.). All four specimens are very worn.—KENNETH HAYWARD, F.E.S. (Capt.); Reservoir, Aswan, Egypt.

PORTHESIA SIMILIS, FUES., IN CUMBERLAND.—The records of this moth for Cumberland appear to be limited to one from Carlisle by our pioneer county entomologist, the late T. C. Heysham, who flourished in the early half of last century. This record was repeated by Morris, Stainton, 'The Victoria History of Cumberland,' and G. B. Routledge, the last-named in the 'Transactions of the Carlisle Natural History Society.' Being thus among our rarest moths I was therefore extremely pleased to meet with a few specimens in July last in the village of Drigg, on the south-west coast of Cumberland. Three were found simultaneously on a garden wall, a fourth on the same wall the following day, a fifth in a hedge bank a short distance away, while a sixth obligingly paid a visit to my lodgings and advertised its presence on the front door!—F. H. DAY; 26, Currock Terrace, Carlisle.

AMPHIDASYS DOUBLEDAYARIA IN THE ISLE OF MAN.—In view of the rapid spread of *Amphidasys betularia* var. *doubledayaria* in England in recent years, it may be of interest to note that in June of last year I took a male specimen of this variety in the little village of Andreas, five miles from Ramsey, Isle of Man. I have been unable to discover if this form has been hitherto noticed in the island. The climate is damp, but mild. No lepidopterist seems to have lived in the neighbourhood for many years past, and immigration seems unlikely.—CYRIL I. PATON; Streatham College, Streatham Common, London, S.W. 16.

MANDUCA ATROPOS ON DARTMOOR.—Whilst collecting on the moor on May 16th, 1921, a farmer, Mr. Dart, of Shady Coombe, Hoo Meavy, near Yelverton, told me of a large moth which had flown into his house about the first week in November last, 1920. I saw it later, and, as might be expected, it is rather badly rubbed, having been kept in a large bottle since the above date. It is now in my possession.—S. T. STIDSTON, Engr.-Commdr. R.N.; H.M.S. "Douglas," 4th Flotilla, at Devonport, May 17th, 1921.

PACHETRA LEUCOPHÆA IN BUCKS.—On the Bucks Chilterns last May I took a fine specimen of *P. leucophæa* as it was sitting on an ant-hill. Has this-moth been reported from the district previously?—WALTER PIERCE; Queen's Road, High Wycombe.

COLEOPHORA AGRAMMELLA IN ESSEX.—Wishing to breed some specimens of *Phalonia alismana* (*Eupœcilia udana*), I went to a small pond on the edge of a plantation about two miles from here

and gathered a good bunch of *Alisma* stems. Upon looking at them on May 24th I noticed a very small *Coleophora* on one of the dead stems, and upon examination was very pleased to find I had got a female of the above. If all is well I hope to find the larva later on. I may add that *Juncus conglomeratus* grows in abundance round the edge of the pond. This is a welcome addition to our Essex list. I have only heard of its occurrence in Herefordshire and Sussex.—
A. THURNALL; Wanstead.

PLATYPTILIA RHODODACTYLUS, F.—The occurrence of this very beautiful species so far north as Huntingdonshire seems worth recording. A female caught on the edge of a wood late in July, 1919, gave the clue to its presence, and a search among the briar bushes early in June, 1920, yielded a dozen larvæ and pupæ. Although hedgerows, full of wild roses and seldom trimmed, abound in the neighbourhood, the insect was only found in a very restricted locality (fifty yards of hedgerow), which perhaps accounts for its passing unnoticed before, in spite of many years' collecting in the neighbourhood. A casual reference to entomological literature seems to show that the species has very seldom been recorded in late years, though it is understood that it still occurs in its old haunts round London. Tutt, 'British Lepidoptera,' vol. v, pp. 256–267, states that the insect has only been noted in Essex, Kent, Middlesex and Surrey. It may also be of interest to quote a statement from the same source that the larvæ have proved destructive to garden roses on the Continent and also in the United States, to which it is supposed the larvæ had been imported in the course of trade in rose bushes. Presumably the pruning to which roses are usually subjected prevents the species from assuming the character of a serious rose pest in England.—
J. C. and F. H. FRYER; Chatteris.

LEPIDOPTERA IN THE ALTON DISTRICT.—I have had very little time this term for Entomology, but what I had I have devoted to the heather country. It was lucky, as there is very little heather left in Surrey and Hants after these disastrous fires. I had to cycle in the evenings about 6 miles from Alton to a very productive stretch of heath, but I found there nearly everything that occurs on such ground. *P. hippocastanaria* was taken on April 13th, and the second brood was out on July 2nd—very early. *Diacrisia sano* was flying freely on June 13th, including female, and I have a few larvæ thereto from just spinning up now (July 29th). *Macrothylacia rubi* was very abundant. I caught two females on the wing in the afternoon, besides males. Other things were *Saturnia pavonia*, *Aspilates strigillaria*, *Acidalia straminata* (one tending towards var. *circellata*), *Lithosia complana*, etc. A curious find was a larva of *Calocampa exoleta* on heather, very conspicuous. I could not observe that it ate heather. It unfortunately died later, probably from eating lettuce: it was so hard to get any wild herbage that was not filthy with vermin and honeydew. Another curious occurrence was that in a very dry spot, among some birch trees, with no other vegetation but heather and dry wiry grass, I came upon a shoal of newly emerged *Acidalia emarginata*. I had only a few boxes left, but took seven or eight of the best in as many minutes. What could it have fed on? In a swamp by a large

heath pond a profusion of *Caenobia rufa* flew at dusk; also I got *Tholomiges turfosalis* (I am nearly sure); it was very hard in the dusk to sort them out among the quantities of small pale micros that were flying, and with the temperature at 80° these little marsh moths dry up before you can set them properly. My other chief capture was a larva of *Odontosia carmelita*, taken on my coat-sleeve when tapping birch-trees with my net. No amount of beating would produce another; it did not look very healthy, but "went down." My *L. cuculla* emerged safely in June, rather late, but I cannot find any larvæ this summer.—E. A. C. STOWELL; Eggars Grammar School, Alton, Hants.

VESPA CRABRO.—On July 26th last, in a warm bank facing the midday sun, I found a hornet's nest. The bank was covered with a layer of thick short heath, through an opening in which I watched the insects coming and going. One was captured, although of course there could be no doubt of their identity. I mention the occurrence as I fancy this is a somewhat unusual place for a hornet's nest.—W. J. LUCAS.

SPHECOLYMA INANIS.—Referring to notes on this species in the last volume (pp. 213 and 263), I am delighted to be able to report that I have at last met with the above fly. I was called to remove a nest of *Vespa germanica* from rockwork in a neighbour's garden, and after getting out the nest I had all but finished filling in the cavity again and was replacing the brick burrs of which the rockwork was composed when I espied on one of them a single specimen of *Sphecolyma*, which allowed me to box it with ease. Whether it had just recently emerged from the nest—by no means a large one—or whether it had just arrived there, I cannot say; the former alternative seems the more probable from the apparent sluggishness of the specimen. I saw no more specimens, and it was of little, if any, use to reopen the cavity on the chance of finding larvæ. Does anyone know whether this species is parasitic in wasps' nests or only a scavenger?—C. NICHOLSON; 35, The Avenue, Dale End, Essex.

MATERIAL WANTED.—Can anyone supply me with samples of any cereals containing specimens of the grain-feeding insects (beetles, moths, etc.)? I particularly want larvæ of *Tenebris* (both species and *Pyralis farinalis*) and imagines of the grain weevils). I will pay postage for reasonable consignments.—C. NICHOLSON; 35, The Avenue, Hale End, E. 4.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*June 1st, 1921.*—The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc., President, in the Chair.—The President announced the death of Dr. Longstaff, and a vote of condolence was passed to his widow and relatives.—Dr. Sharp, M.A., M.B., F.R.S., etc., was elected a special life fellow. Mr. P. V. Castling, of Peshawar, India, and Dr. S. C. Harland, D.Sc., of Shirley Institute, Didsbury, were elected Fellows of the Society.—The Treasurer made a statement explaining that the Society as a friendly society had been pronounced free from all income tax,

except on the interest on the debentures. He also made a statement as to the portraits of distinguished entomologists that had been hung in the Society's rooms, and expressed the hope that other portraits and documents of entomological interest would be presented to the Society.—The President read a statement as to the death of a number of distinguished Russian entomologists during 1916-20.—Prof. Poulton exhibited varieties of *Pyrameis cardui* and an example of a very large *Papilio, P. homerus*, F., that visits the very small flower of *Asclepias currassavica*; examples of *Libythea*, probably *L. larus*, from Tanganyika territory, congregating perhaps before or during migration; notes on the courtship of *Monomotarpa insignis*, Distant; coprid beetles believed to be internal parasites, and expressed the view that such cases were due to trickery on the part of native medicine men.—Comments were made by the President and Mr. Durrant.—Mr. Donisthorpe exhibited a specimen of *Argynnis euphrosyne* carrying a portion of the pupa case—Some discussion arose as to the effect of damage to antennæ on the flight of butterflies.—Dr. Gahan exhibited examples of the larvæ of *Phytodecta viminalis*, and called attention to the existence in these larvæ of eversible glandular structures between the seventh and eighth dorsal segments.—Comments were made by Mr. C. B. Williams, who said that he found *P. viminalis* to be viviparous.—Mr. Morice exhibited (1) examples of *Anthophora pilipes*, of which he had seen no ♀ ♀, and described attempts made by the ♂ to pair with ♀ ♀ of the Humble Bee; (2) a ♂ sawfly, *Tenthredopsis palmata*, Geoffr., with an abnormal wing neuration, apparently a reversion to a primitive type.—Mr. Talbot, on behalf of Mr. J. J. Joycey, exhibited examples of *Heliconius* from Venezuela.—Dr. Dixie exhibited Pierines from Central Peru.—Comments were made by the President, Prof. Poulton, and Mr. Rosenberg.—Two papers were read (1) by Mr. Donisthorpe on "Mimicry of Ants by other Anthropods," and the author exhibited a number of examples to illustrate this. Comment was made by Prof. Poulton: (2) By Mr. G. Arrow on "Erotylid Coleoptera."—H. ROWLAND-BROWN, M.A., Hon. Secretary.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, January 17th, 1921, the President, Mr. R. Tait, in the Chair.—Mr. Frederick William Holder, 20, Hawesside Street, Southport, was elected a member of the Society.—A discussion on "The Genus *Tæniocampa*," was opened by the Rev. F. M. B. Carr, who exhibited his collection of this genus in illustration of his remarks. He also showed photographs of the ova of the different species by Mr. A. E. Tonge, Reigate. The following members took part in the discussion, and exhibited their series of the *Tæniocampidæ*; Mr. S. Gordon-Smith, vars. of *T. gothica*.—Mr. W. A. Tyerman, *T. opima*, from Wallasey, selected from a large number bred by himself.—At Eccleston Mere, where nearly all the swallows grow in the water, Dr. J. Cotton had noticed that the moths which fell into the water when the bushes were shaken had no difficulty in swimming to the bank.—The President described several of the best known localities for *Tæniocampidæ*, such as York, Hereford, Lakeside, etc., and remarked on the

tendency of *T. miniosa* to cannibalism when the larvae were too closely crowded in confinement.—Mr. Tait also exhibited *Asphalia diluta*, *Epunda nigra*, *Polia chi* and *Anchocelis rufina* from Lakeside and *Polia flavigincta* from S. Devon.—Messrs. J. W. Griffin and A. W. Hughes contributed notes on collecting at sallow bloom.

Monday, February 21st, 1921.—The President in the Chair.—Mrs. O'Sullivan, 10, Cathedral Mansions, Huskisson Street, Liverpool, and Mr. W. G. Clutton, 136, Coal Clough Lane, Burnley, were elected members of the Society.—The feature of the evening was the competition for the Society's prizes specially offered for the encouragement of field work and observation. A prize of five guineas for the best series of sixty males of *Hybernia defoliaria* first engaged the attention of the judges. So good were the exhibits in this class that it was no easy matter to determine upon the most meritorious; eventually it was decided to award the prize offered for an essay upon the insect fauna of the sand-hills as a second prize in this class, there being no essay entered. The first prize of five guineas was therefore awarded to Mr. Chas. P. Rimmer for his set of the moth from Delamere Forest and Eastham Woods; the second, two guineas, was given to Mr. W. G. Clutton, of Burnley, for a collection made in the neighbourhood of that town. There were some very beautiful forms shown by the competitors, including melanic variations from Burnley. Other exhibitors in this section were: the Rev. F. M. B. Carr (highly commended), Messrs. J. W. and G. A. Griffin and W. A. Tyerman. A prize of five guineas was also awarded for the best six photographs of insects in their natural resting positions selected to show the effect of protective resemblance. In this competition the prize went to Mr. Hugh Main, of London, for a very fine exhibit. These photographs were much admired, particularly the "*Eryophila perla* at rest on sandstone wall," this being an exceptionally fine example of protective resemblance. Prof. R. Newstead, F.R.S., and Messrs. Crabtree and Mansbridge were the judges in the competitions. Other exhibits were insect preparations under the microscope by Mr. Chas. P. Rimmer and long series of early spring Lepidoptera by Mr. S. Gordon Smith; the latter included some nice varieties of *Hybernia leucophæria*, *H. marginaria* and *Nyssia hispidaria*; further, the same member showed a fine specimen of *Acherontia atropos* captured near Chester.—WILLIAM MANSBRIDGE, Hon. Secretary.

RECENT LITERATURE.

Annals and Magazine of Tropical Medicine, April 27th, 1921, vol. xv, No. 1. Liverpool.

AMONGST the contents are:

A Scientific Record of the School of Tropical Medicine. By D. Allmand. With 9 plates.

Observations on Mosquitoes in the Isle of Man. By B. Blacklock and H. F. Carter. With 5 plates and a map.

Notes on Some Unusual Breeding Places of *Stegomyia fasciata*, Fabr., in Australia. By G. F. Hill. With 1 plate.

Musca domestica, Linn., as a "Bush Fly" in Australia. By G. F. Hill.

New Tsetse-flies (*Glossina*) from the Belgian Congo. By R. Newstead and A. M. Evans. With 6 good figures.

On a Collection of Pappataci Flies (*Phlebotomus*) from India. By R. Newstead and Major J. A. Sinton. W. J. L.

Insect Pests of Farm, Garden and Orchard. By E. DWIGHT SANDERSON.

Second edition, revised and enlarged by LEONARD MARION PEARS. Pp. v + 707, with 604 figures in the text. New York : John Wiley & Sons, Inc. London : Chapman & Hall, Ltd., 1921. Price 26s. net.

THE main purpose of this excellent and well-illustrated volume is to enable the farmer, fruit grower, etc., to become acquainted with insect pests in all their stages, and also with the means now employed to control their ravages.

The subject-matter is arranged in chapter form, and in one the "beneficial insects" or those which prey upon and destroy the "injurious insects" are considered. In another chapter the insects affecting man and his home are discussed.

Most of the species referred to in the work belong to genera occurring in Britain, and many are identical species, as, for example, *Sesia tipuliformis* (the currant borer), *Leucania unipuncta* (the army worm), *Laphygma exigua* (beet army worm), and *Heliothis armigera* (the cotton bollworm) among the Lepidoptera.

It has been stated that in the United States insects damage or destroy the produce of farm, orchard and garden to the value of something like one thousand million dollars annually. A capital index greatly facilitates reference to the volume.

Studies on Arthropoda—I. By Dr. H. J. HANSEN. Pp. 8. With 40 copper plates. Gyldendal, 11, Burleigh Street, Covent Garden, London, W.C. 2. 8s. net.

CONTENTS: The Pedipalpi, Ricinulei and Opiliones collected by Mr. Leonardo Fea in Tropical West Africa.

On Stridulation in Crustacea Decapoda.

On the Postembryonic Occurrence of the Median "Dorsal Organ" in Crustacea Malacostracea.

A Book about the Bee. By HERBERT MACE. With 24 illustrations on art paper from photographs by the author. Pp. x + 138. London : Hutchinson & Co. 4s. net.

THE author appears to have a thorough knowledge of his subject, and has given "a plain account of the life and death of the busy occupants of the darksome hive."

To those who are bee-keepers, as well as to others who do not wish to undertake the care of hives, this book should appeal. The story of bee life is pleasantly told in twenty instructive chapters, and the photographic illustrations serve to adorn the tale.

Les Coléoptères d'Europe France et Régions Voisines Anatomie générale : Classification et tableaux génératifs illustrés. Par C. HOULBERT. Tome premier avec 104 figures dans le texte et 16 planches. Paris : Librairie Octave Doin, 1921. 10 francs.

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THE LIFE-CYCLE AND HABITS OF *CYDIA LEGUMINANA*, Z., WITH A NOTE ON ITS SYNONYMY.

By W. G. SHELDON, F.Z.S., F.E.S.

In the year 1915, as related in vol. xlix, pp. 19-20 of this magazine, I was so fortunate as to meet with specimens of this hitherto very rare species, which had not been recorded for many years, in the Wicken district, and since then I have been engaged at intervals in working out its life-history and habits.

The problem has not been an easy one to solve, largely because I was only able to visit its haunts at intervals, but also because its real larval habits and pabulum were quite unsuspected, and, when ascertained, difficult to follow.

It has generally been assumed that the larva fed, as do several of its supposed near relatives, and as its name would suggest, on the seeds of some leguminous plant, and one persistent student of its habits even relates that he gathered all the seed-pods of the only likely leguminous plant growing in its Epping Forest locality without result. In view of what I have to relate this is not to be wondered at.

As stated in my note (*loc. cit.*), the imago at Wicken frequents hedges of very mixed growth in which I could not find any leguminous plant. I may here say that the last captor who made a record of taking specimens previous to 1915, the late Lord Walsingham, informed me shortly before his death that his examples taken in 1878 occurred in the same hedge as that from which my 1915 captures came.

My first example was beaten out of elm into my net about noon on June 20th, 1915; later the same day I beat or captured flying several others, and during the course of my stay at Wicken of about one week, hard work resulted in my obtaining about fifty specimens.

Almost all these came from the hedge I have mentioned, the bulk of which consisted of the common elm (*Ulmus campestris*), and the moths seemed in some way attached to this tree. In addition to most of the hedge itself being elm, there were numerous elm trees in the hedgerow, some of them were pollarded, and some were trees of large growth forty or fifty feet in height. The insects flew freely and swiftly in the afternoon sun, but as they were small, dark, and inconspicuous, and as, moreover, the hedge swarmed with *Simaethis fabriciana*, which flew with, and

was not easily distinguished from them, at first at any rate, they were not too easy to negotiate. In addition to observing that they were in some way connected with elm, I very soon noticed that almost all my captures were around the pollarded trees, although I could not be certain that they did not equally frequent the tall trees, the tops of which would of course be beyond my vision in the case of such a small object. So impressed was I with this connection with elm that I brought home several females and sleeved them over branches of this tree in the garden here for ova, but the result was *nil*.

I was not able to re-visit Wicken in June until the year 1918, but in that year I spent a fortnight during the latter part of June largely occupied in trying to solve the *leguminana* problem. I found the moths fairly common, and it soon became apparent that the opinion formed on my previous visit of a connection with elm was correct, but what was this connection? It took long and careful observation before I got any nearer. It occurred to me that they might possibly feed in the seeds, but I could not find any seeds, and the few females I met with seemed to frequent mostly the bases of the branches where they joined the trunk, rather than farther out where the seeds might be expected to grow. Eventually I found a very good tree, around which both males and females were common. It was a pollard of course, very rugged, and with a fairly luxuriant growth of ivy growing against its trunk, but not by any means covering it. I thought I had solved the mystery, and that the larvae fed in the berries of the ivy. A close examination of a large quantity of berries did not, however, reveal any signs of ova, and so that idea was exploded.

Eventually on June 30th I saw a female flying slowly and in a business-like way around an accumulation of dead and dying bark which covered an excrescence in this elm trunk where it had been injured by the axe in cutting off branches years ago. I watched her settle on the excrescence, crawl out of sight underneath a piece of dead bark, emerge and disappear again behind another piece of bark; after she had done this several times I set to work breaking off pieces of dead bark, and with the aid of a lens detected several undoubted tortrix eggs. I felt quite satisfied that I had at last read the riddle. Unfortunately during the next few weeks I was unable to examine these eggs daily. On August 4th I found the larvae had emerged, but there were no signs of them, and subsequent examinations of the bark were not more successful in detecting larvae.

In July, 1919, I was again at Wicken, and examination of the excrescences on this and other elm trees resulted in my finding a considerable quantity of red-brown frass, and under pieces of bark several cocoons, which, with the pupa cases attached to them were evidently those of a tortrix. In May, 1920, I made another attempt, and by wrenching off pieces of bark which showed by

the red frass outside traces of larvæ, I succeeded in obtaining a number of pupæ from which in the following month I actually bred five examples of *leguminana*.

The next step was of course to investigate the larva, and at the end of August in the same year I found a number of larvæ which it seemed almost certain must be this species, but I could not succeed in hibernating them; it was therefore necessary to procure another supply in the spring of this year, which I obtained on March 24th; these pupated in due course, and somewhat to my relief, emerged early in June as *Cydia leguminana*. I had felt pretty sure they were this species, but could not be certain, because there is another species, *Phtheochroa schrebersiana*, whose larval habits are somewhat obscure, and which is found in the *leguminana* district. The pupa cases of this species I have actually seen in Hungary sticking out of elm bark.

DESCRIPTION OF OVUM.

The ovum is of the usual tortrix shape, horizontal of course, about .5 mm. long by .38 mm. broad, dull red in colour when deposited on June 30th, 1918; a week afterwards it was light grey and slightly opalescent; the surface was rough and pitted, divided into a large number of small spaces, separated by very fine raised lines; these spaces were irregularly shaped and the dividing lines curved. The divisions were so small and indistinct that they were not discernible in the microscope with a 2-in. lens, but they were distinctly made out by using a 1-in. lens.

On August 4th the larvæ had emerged, probably some time previously.

A larva measured on August 28th, 1920, was then about 8 mm. long and in the last instar; of average stoutness, not attenuated to either extremity. The head was reddish brown and glabrous, the lobes were rather prominent. The prothoracic plate was light brown and glabrous with two darker crescents in front pointing towards the head. The contents of the intestinal canal showing distinctly as a reddish medio-dorsal stripe. The anal plate was dark brown and glabrous; the sub-dorsal and ventral areas, prolegs and claspers were putty coloured and glabrous. The tubercles and spiracles were extremely large and prominent, dark greyish brown in colour. The larva was somewhat spiny; it was fairly active, and on being exposed to the light assiduously sought concealment and darkness. On October 13th I turned out of the tin in which I had kept the larvæ with the pieces of bark on which they fed and found they were all dead and mouldy, although on October 1st I had seen a larva crawling on the glass lid of the tin. On March 24th last I again procured a number of larvæ. Some of these were spun up in compact cocoons formed by the larval frass, and lined with white silk, but some were

crawling about under the dead bark and were not in a cocoon or hibernaculum. These latter, however, in a few days had spun their cocoons.

It should be noted that the season at the end of March, 1921, was fully a fortnight in advance of an average season. These larvæ had not increased in size so far as I could see since the previous autumn, but they had lost their red tint and were greenish white in colour; evidently they had not fed in the spring, for the red tint is caused by the contents of the intestinal canal showing.

The pupa of the male is about 5 mm. long and 1·25 mm. broad, that of the female 7 mm. by 1·5 mm., stout in proportion to its length, light reddish brown in colour, the wing-cases lighter than the thorax and abdominal segments. The whole of the pupa is smooth and glabrous. The wing-cases extend to the rear of the fifth abdominal segment. The abdominal segments have the usual rows of spikelets; there are no anal hooks and the pupa is loose in the cocoon; in the place of anal hooks there are four slightly curved spines. The fourth and fifth abdominal segments are of the same width in the rear as they are in the front; the sixth tapers to the rear; the seventh has a hollow outline and a ridge at the rear; the remainder of the abdominal segments form a funnel-shaped extremity blunt at the anal termination. At the intersection of the abdominal segments are a few short spines pointing rearwards. The head is blunt and rounded without any trace of a cocoon opener; the extremity of the wing-cases forms a slight bulb; the antennæ and eyes project rather noticeably above the wing-cases.

The cocoon is usually attached to the inside of a piece of loose bark and when this is picked off the trunk it generally adheres to it. Two or three days before emergence the markings of the wings show very plainly through the pupal envelope, especially the white dorsal blotch. The first imago emerged on May 30th, 1920, and on June 1st four specimens emerged and their wings were fully developed by 7.45 a.m. Almost all the emergences take place very early in the morning.

Leguminana is to be found everywhere around Wicken that I have investigated amongst pollard elms. It prefers excrescences which have the bark soft; these are usually to be found on the southern and western sides of the trees. In such situations a suitable excrescence will contain from one to several dozens of larvæ, whereas on the other sides where the rain does not often beat against the trunks the swellings would only contain one or two larvæ and in many cases none at all.

When a tree is pollarded there is a tendency to form excrescences where the branches have been cut off; these continue healthy for some years, but the bark gradually dies, and it is upon this dying bark, or rather at the junction of the dead and healthy portions, that the larva feeds.

As I have before stated, the imago flies freely in the sun around the pollard elms during the afternoon; in the morning it is sluggish and can then only be beaten out, and if the weather is cold it is best to beat the elm branches into an umbrella, into which the moth falls and remains quiet.

The imagines are on the wing in an average season from about the end of the first week in June for a month or more, but in the last two seasons, which, of course, were abnormally early, the males especially were flying at the end of May.

One or two continental lepidopterists, judging from what Hoffmann in the Spuler edition (1908, ii, p. 293)—says—“It lives according to Schmidt on *Alnus*, according to Disque in Autumn (November) under the bark of *Fagus*”—seem to have known a fragment of its life-history. I believe there is a good deal of beech growing in the locality in Epping Forest, and it is quite probable that the larva feeds upon this tree as stated by Disque, although his remark would lead one to think that he meant that it hibernated or pupated only under the bark. It is certain that elm is not found nearby, but hornbeam is very abundant, and it is possible, and indeed it appears to me most probable, that the larva then fed upon the bark of this tree. I do not think there are any alder trees to be found there.

The nomenclature of the species is a trifle puzzling. The oldest name that has been applied to it, *lathyrana*, Hüb., is a misnomer. His figure (Tort. 207, 1811?), whatever it may have been intended to represent, is certainly not this species. It is most like *Laspeyresia perlepidana*, Haw., and it is generally considered to refer to that species, to which it is assigned by Herrich Schäffer. There can be no question but that the correct name is *leguminana*, Zeller (1846). Herrich Schäffer's name, *deflexana* (fig. 277), is dated 1848; it is stated by him to be a MS. name of Fischer von Röslerstamm, and must fall before that of Zeller. *Interruptana*, Wilk., is another misnomer: he calls it “*interruptana*, H. S.” but this species has nothing to do with *leguminana*, Zell. Herrich Schäffer figures it (fig. 280) as a distinct species from his *deflexana* = *leguminana*, Zell.; it is now known to be the *duplicana* of Zetterstedt. There is still another name, *dorsilunana*, Erschoff, but this is dated 1877—long after Zeller's date.

The first example of *leguminana* taken in Britain is the one in the Doubleday Collection, which is recorded by Wilkinson,

Brit. Tort., p. 211 (1859): “A single specimen of this insect is in the cabinet of Mr. H. Doubleday, which was captured several years ago in Devonshire in June.” One is strongly inclined to think that this specimen originated very much nearer than Devonshire to Doubleday's residence, i. e. in Epping Forest, some three miles from it!

Youlgreave,

South Croydon;

September, 1921.

NEW AND LITTLE KNOWN BRITISH APHIDES.

VI.

BY FRED. V. THEOBALD, M.A.

Anuraphis centauriella, nov. sp.

Alate viviparous female.—Head and thorax brownish black; abdomen pinkish brown, pinkish ochreous or pinkish green, with black transverse markings in the form of a black blotch on the posterior two-thirds of the abdomen and a row of black spots at the sides. Cornicles brown. Legs light brown, with the femora, apex of tibiae and the tarsi dark brown. Antennæ dark brown; shorter than body; basal segment a little wider, but no longer than second; third nearly twice as long as the fourth, with 35–50 round sensoria over its whole length; fourth larger than fifth, with 10–12 sensoria; fifth with only one round subapical one; sixth as long as 4 and 5, basal area about half the length of flagellum in one specimen, in others one-third of the length. Proboscis reaching nearly to third coxae. Cauda and anal plate deep brown, the former bluntly triangulated, with a few hairs; the latter also with a few hairs; cauda about as long but wider than cornicles. Cornicles cylindreal, somewhat contracted at apex, which is flanged. Wings normal.

Length, 1·5–1·7 mm.

Apterous viviparous female.—Dingy pale green, tinged in parts with pale pink. Legs and antennæ pale ochreous brown. Cornicles and cauda pale brown. Front of head pale brown, sometimes suffused with pink. Eyes dark brown. Antennæ about one-third the length of the body; of five segments, the basal one wider but no longer than second; third as long as fifth; fourth small, about one-third of third; fifth with flagellum a little longer than base, the latter longer than fourth. Cauda broad and blunt, about as long as the cornicles; anal plate rounded, both with a few hairs. Cornicles short, conical. Legs rather short.

Length, 1·2 mm.

Nymph.—Pale clear green; head, wing buds and legs brown. Eyes dark brown. Cornicles same colour as body, tipped with pale brown. Antennæ of six segments.

Food plant.—Knapweed (*Centauraea nigra*).

Locality.—Inverness-shire, N.B. (7. ix. 20) (D. J. Jackson Coll.).

Observations.—Described from several alate females and one apterous female. The coloration is very marked. The notes were taken by Miss Jackson from living specimens. She found this insect amongst colonies of *Macrosiphum jaceæ*, Linnaeus, clustered near the flower-heads. The majority were alate

females and nymphæ. One apterous female occurs on one slide, but I do not think is mature. The antennæ have only five segments. This species is quite distinct from any *Anuraphis* I know of.

Thripsaphis cyperi, Walker.

Oviparous female.—Apterous. Light brown, the anterior portion of the body frequently lighter and more of a greenish brown; the divisions of the segments all yellow, with their margins less defined on the sides, where the yellow area is wider on each segment; the segmental divisions are also marked with dark lineal streaks. Cornicles as small yellow pores. Apex of body tipped with brown. Antennæ blackish brown. Legs brown. Eyes dark red. Venter yellow. Body with a few very short hairs, only seen under the microscope. Usually a pale undefined line in the middle of the anterior segments. Antennæ of six segments; from a little under to a little over half the length of the body; basal segment much larger than second; third longer than fourth; fourth about half the length of third and equal to the fifth, the latter with a small pale subapical sensorium; sixth longer than fifth, the basal area nearly as long as the flagellum. Eyes large, no ocular process. Proboscis thick, not quite reaching to the second coxae. Legs thick and rather short; hind tibiae with many pale sensoria, not quite reaching to the apex. Cauda somewhat quadrangular at the swollen extremity, with a few short hairs. Anal plate retracted, bilobed, with a few short hairs.

Length, 1·8 to 2 mm.

Larval oviparous female.—Smaller and browner than mature female. Yellow, with brown areas and brown spots and dots. Cornicles as yellow pores, in centre of a brown spot. Legs and antennæ brown. Like the adult covered completely with white tomentum. The antennæ more than half the length of body; basal segment larger than second; third nearly twice as long as fourth; fourth and fifth equal; sixth longer than fifth; basal area longer than flagellum. Proboscis very broad, reaching just past second coxae. Legs short and thick; tibiae with a few short stiff hairs. Cauda triangulate at knobbed end.

Apterous viviparous female.—Elongate and more Thrip-like than the oviparous female. Antennæ about half the length of the body, proportions same as in oviparous female. Proboscis reaching just to the second coxae. Cauda markedly knobbed, the apex rounded. Anal plate bilobed, lobes widely separate, with a few bristles. Hind tibiae narrow, narrower than the fore and the mid, all with numerous short hairs; one marked chaeta on each small first tarsal segment, shorter ones on the second tarsals. Cornicles rather more raised than in the oviparous females.

Length, 2 mm.

Food plant.—*Carex goodenovii*, L. Gray.

Locality.—Kyle, N.B. (D. J. Jackson).

Observations.—Described from specimens taken by Miss Dorothy Jackson on rushes on marshy ground. They are, she says, "extraordinary aphides, found usually singly resting on the tips of the leaves. They were quite conspicuous, being covered with greyish-white tomentum. The moment the grass was touched they dropped off." The small lineal ova were also found on the leaves covered with whitish-grey tomentum. The Thrips-like appearance of the insects is very marked. From Laing's redescription ('Ent. Mo. Mag.' lvii, 120, 1921) of Walker's *Aphis cyperi* it appears that this is the oviparous stage of that insect, although, as Mr. Laing kindly writes me, there are certain minor differences, such as size, slightly different antennal proportions, and absence of sensoria on segment iii of the antennæ; all of which are quite likely in the oviparous stage.

Pterocomma jacksoni, nov. sp.

Apterous viviparous female.—Variegated in colour, ground-colour pinkish-brown, but median area of the abdomen pale greenish, merging into pink in region of the cornicles; a pale dorsal line commences on the mesothorax and is continued to the cauda. On the sides of the thoracic segments are blotches of very dark green; these are continued on the three median abdominal segments, interrupted on the segment in line with the cornicles and then continued as darker green patches to the end of the body. Some specimens are unicolorous pinkish-brown. Legs ochreous, with apex of femora and tibiæ and all the tarsi brown; in hind legs all the tibiæ are brown. Proboscis long, ochreous, apex brown. Antennæ ochreous, with basal segments brownish and apex dusky. Cornicles ochreous, in some bright orange. Venter uniformly yellowish or pinkish yellow, with a brown spot at apex of abdomen. Eyes black. Body, especially venter, dusted with tomentum. Hairs on legs rather close and sloping towards the apex (not more or less erect as in *populeus*). Antennæ about half the length of the body, with long, rather dense hairs; basal segment a little longer than second; third the longest, with 7-9 round sensoria on the basal three-fourths; fourth segment about as long as fifth, the latter with the usual sub-apical sensorium; sixth a little longer than fifth, its basal area not quite so long as the flagellum, the basal area has many fine long hairs like the others; proboscis reaching to third coxae. On the pronotum a marked papilla on each side, normally *truncate*. Body very hairy. Legs very hairy, fore pair rather short and thick; mid longer; the hind with very long and densely hairy tibiæ. Cauda and anal plate very hairy, the latter rounded and the former longer and narrower, but rounded. Cornicles about as long as fifth antennal segment, narrowed at base, slightly swollen near apex, where it is constricted; apex flanged; nearly twice as long as hind tarsi. There is a small pale crenulated membrane on the inner side of the femoro-tibial joint. The immature forms show abdominal lateral papillæ and have no antennal sensoria and shorter legs.

Length, 3 mm.

Food plant.—Goat Willow (*Salix capreae*).

Locality.—Inveran, Invershin, N.B. (8 . ix . 20) (D. J. Jackson Coll.).

Observations.—Described from mounted specimens and live colour notes sent me by Miss D. J. Jackson, who found this insect thickly clustering along the branches of a goat willow growing in a birch wood, in company with *P. populeus*. It was closely attended by ants (*Formica rufa*), that had many nests in the locality. The Aphides harmonised closely with the colour of the branches. This species closely resembles *populeus*, but the antennæ of the apterous female carry marked round sensoria, and the hairs of the legs are much closer and slope towards the apex of the leg, whilst in *populeus* (*pilosa*) they are further apart and more erect. The prothoracic papillæ are very marked, being truncate, but in one specimen one papilla is rounded apically, the other being markedly flattened at the apex.

Pterocomma fraxini, nov. sp.

Apterous viviparous female.—Dull reddish-brown, with dark median and lateral patches, from which very small tubercles arise and also on the pronotum. Antennæ reaching just past the third pair of legs; two basal segments dark; third and fourth pale, dusky at apices; fifth and sixth dark; basal segment larger than second; third about twice as long as fourth, which is about equal to fifth; sixth with flagellum twice as long as basal area (unlike *P. populeus*); hairs long, fairly numerous, but not so much so as in *populeus*, pale on third segment, darker elsewhere; sensoria on fifth and sixth normal. Cornicles projecting and about as long as fifth segment, nearly twice as long as the hind tarsals, swollen apically on one side and constricted near or at apex; dull yellowish, dusky at apex. Cauda dark, rounded; anal plate paler, both hairy. Legs pale to deep yellowish-brown, fore and mid femora and tibiæ thick, apices of tibiæ broad and truncate; tarsi narrow; apex of tibiæ dark. Antennæ, body and legs very hairy.

Length, 3·9 mm.

Locality.—Wye (3 . vi . 11).

Observations.—Described from a single colony found on the petiole of an ash leaf (*Fraxinus excelsior*). It is more robust than *Pterocomma populeus*, from which it also differs in (1) the longer and larger cornicles and (2) the long flagellum to the sixth antennal segment. It most nearly approaches *P. bicolor* of Oestlund, but the cauda is not broadly angulated. The thick legs are very characteristic.

SOUTH AMERICAN EUMOLPIDÆ, MOSTLY OF THE
GROUP COLASPINI.

BY FRED. C. BOWDITCH.

(Continued from p. 216.)

Rhabdopterus grenadensis, sp. nov.

Form of *piceipes*: body below dark brown, feet lighter, with darker knees; above uniform bronzed, head and thorax sparsely punctured, especially the latter at the middle; elytra more coarsely punctate, seriate on the disc and apex, and costate at the latter. Hind tibia of ♂ without sinuation.

Type, 2 ♂, 8 ♀, St. Vincent, Grenada.

Length, 4·5-5·5 mm.

Head with the usual cross and longitudinal impressions rather obsolete, the sparse punctures less evident at the vertex. Antennæ rather stout; joints 7 and 11 noticeably dark, those between more or less piceous; thorax with rounded sides, obsoletely subangulate at the middle. Elytra with usual depression within and below the shoulder feebly indicated, obsoletely so in the ♀. Punctuation is coarse and at sides confluent, forming rugæ; the last ventral segment in the ♀ is emarginate, without teeth; the edges of the thorax and elytra are narrowly metallic. As compared with *piceipes*; the punctuation of the thorax is much sparser and that of the elytra much coarser, the colour of the antennæ differs, and the hind tibia of the ♂ and ventral of the ♀ are simple.

Rhabdopterus blatchleyi, sp. nov.

Larger than *piceipes*; below, dark chestnut brown, with somewhat lighter legs; above, bronzy brown, the thoracic and elytral edges and the punctures all more or less metallic green, the hind tibia of the ♂ strongly dilated for its apical half, last ventral of ♀ tridentate.

Type, 5 ♂, 5 ♀, Dunedin, Fla. (Blatchley); also 1 ♂, Charleston, 1858 (J. Gray). The Blatchley specimens are all more or less broken as to legs and antennæ.

Head with smooth antennal calli and light depressions; punctuation moderate, more crowded in front; antennæ with joints 7, 10 and 11 dark; thorax finely and nearly evenly punctate, sides rounded, subangulate at the middle. Elytra obsoletely depressed within and below the shoulder, thickly punctured (much coarser than the thorax), subseriate on the disc, with smooth intervals behind in the form of obsolete costæ. As compared with *piceipes*, the thoracic punctuation is much closer and more even, the general form is usually larger and the

δ tibia very different. Sent me by Mr. Blatchley as *piceipes*, but not agreeing with the northern form, and certainly not agreeing with Dr. Horn's remarks, 'Trans. Am. Ent. Soc.', vol. xix, p. 227—"tibia slightly sinuate in the inner edge." It seems to me probable, however, that this is the form described by Olivier as *piceipes*.

Still another form is indicated in the Blatchley material by one δ , two ♀, rather more elongate and parallel, with simple hind tibia in δ . I hesitate to describe it until all the forms can be brought together with a larger material.

Rhabdopterus similis, sp. nov.

Small, stout. Below with legs dark brown; breast and legs tinged with æneous; above entirely greenish, bronzed æneous, shining; antennæ rufous with the last five joints fuscous.

Type, 2 δ , 2 ♀, Cochabamba, Boliv. (Germ.).

Length, 4 mm.

Head thickly and strongly punctate, a little more crowded on the epistome, a fairly well-marked transverse groove but no longitudinal; labrum square, rufous; thorax transverse, subangulate at the middle, thickly punctate, more or less crowded at sides, punctures finer than the head, sides with a faint median depression; elytra with well-marked, but short, cross depression below the shoulder, very finely punctate striate, obsoletely costate at the tip and sides; the thoracic and elytral margins are narrowly brilliant metallic green, but not particularly noticeable on account of the general colour. In general aspect resembles *apicicornis*, Jac., as identified by me, lacking, however, the thoracic angulation.

Rhabdopterus angulicollis, sp. nov.

Medium sized, stout. Below, with legs, entirely rufous; antennæ rufous, joints 7, 8 and 11 fuscous; head rufous, slightly iridescent in certain lights; thorax and elytra brilliant green bronze, dominating a rufous under-colour; thorax transverse, noticeably angulate back of the middle and with a strongly-reflexed margin.

Type, ♀, Salinas, Beni R., July, 1895, Stuart.

Length, 4.5 mm.

Head finely punctulate, with a well-marked frontal fovea; labrum rather deeply notched; thorax slightly collared in front, moderately punctate with mixed punctures, with small smooth areas before and behind at the middle, and a slight lateral depression in line with the angulation. Elytra with moderate cross-depression, the whole surface strongly punctate striate on the disc and next the suture, confused at the side, forming transverse rugæ; intervals subcostate at the apex. This form is allied to *semifulvus*, Jac., and seems to be the largest of the forms with

angulate thorax as described by Mr. Jacoby. The angulation as well as colour easily indicate this form.

Rhabdopterus tarsata, sp. nov.

Medium, stout. Below dark brown, or pieaceous æneous; apex of abdomen rufous; legs rufous, with apex of tibia and tarsi dark cyaneous; body above shining, chestnut brown, overlaid with greenish æneous; antennæ rufous, with joints 7, 8, 10 and 11 dark.

Type, ♂, Mecas, Ecuador.

Length, 4 mm.

Head finely and rather sparsely punctulate, with well-marked transverse and longitudinal impressions; thorax obsoletely collared in front, sparsely, unevenly, mixed punctulate; elytra with obsolete transverse depression coarsely punctate, semiseriate on the disc, subcostate at the base and strongly costate at the apex, more or less rugose at the sides; thorax and elytra with narrow reflexed margins, these and the punctures obsoletely metallic green.

Rhabdopterus aciculatus, sp. nov.

Large, stout. Below with legs very dark brown; breast and thighs tinged with æneous; above shining bronze; thorax irregularly, but at sides closely, aciculate punctate; elytra strongly punctate; disc seriate, intervals at the sides and apex strongly costate.

Type, ♀, Rio Madeira, Brazil (Mann and Baker).

Length, 6 mm.

Head with transverse and longitudinal grooves, rather closely punctate, especially on the epistome, and becoming strigose at the vertex and back of the eyes; labrum rufous, antennæ rufous, becoming fuscous at the tip; thorax transverse, sides rounded, margined, narrowed as usual at the front, but not distinctly angulate; an irregular smooth area on the middle disc and in front; punctures larger and more crowded at sides. Elytra with transverse depression below the shoulder. The sides have four or five well-defined costæ from the shoulder to apex; the latter is entirely and regularly costate striate with the intervals finely pubescent; the tip of the abdomen is rufous, punctate, and broadly emarginate.

This is one of the undetermined forms of the Stanford Expedition to Brazil spoken of in 'Psyche,' vol. xx, p. 125.

(To be continued.)

FOUR NEW MOTHS FROM THE PHILIPPINES.

BY A. E. WILEMAN AND RICHARD SOUTH.

Characoma (?) albisepta, sp. n.

♀. Head and thorax white, marked with black; abdomen grey, darker towards tip. Fore wings greyish-brown clouded with blackish on costal area, traversed by black irregular lines; basal line white, short, connected by a white streak with the antemedial line, which is also white and bluntly serrate; medial line white, bidentate; post-medial line white, not reaching the costa; all three lines interrupted below the median nervure and represented by white marks on dorsum; subterminal line black, outwardly edged with white, sinuous towards costa, crenulate towards dorsum; three white marks between end of the cell and apex of the wing; a grey patch on tornal area. Fringes grey-brown marked with white, a black dotted line at base. Hind wings greyish, becoming blackish on terminal area. Underside of fore wings dark fuscous, white-marked on apical half of costa; of hind wings greyish, darker on margins.

Expanse, 30 mm.

A female specimen from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), November 8th, 1912.

Amyna (?) indigata, sp. n.

♀. Head, thorax and abdomen brown. Fore wings brown, reniform stigma partly outlined in white, a short white streak from costa before apex, four white dots on costa, the largest above reniform; sub-basal and antemedial lines whitish, crenulate, the sub-basal inwardly edged with black, both obscure but more distinct on costal area; postmedial line black, crenulate, excurred from costa to below middle thence incurved to dorsum, followed towards costa by pale brown marks between the veins; subterminal line darker brown, crenulate; white dots at terminal ends of veins. Hind wings brown with traces of a darker postmedial line, most distinct and pale-edged towards dorsum; terminal line pale brown. Underside greyish, fore wings brownish suffused, with curved, blackish, postmedial and diffuse subterminal lines; hind wings freckled with brownish, discal dot black, crenulate, postmedial line dark brown.

Expanse 30 mm.

A female specimen from Manila, prov. Rizal, Luzon (sea level), July 11th, 1912.

Except that it is larger this species seems to be near *A. crocosticta*, Hampson.

Habrosyne costalis, sp. n.

♂. Head and thorax brown, marked with darker; abdomen grey-brown tipped with darker. Fore wing brown slightly tinged with olive, costal area between antemedial and postmedial lines whitish clouded with brown; a short oblique silver streak on basal area;

reniform stigma partly outlined in white; antemedial line silvery white, oblique, interrupted, most distinct towards costa, less in evidence towards dorsum; postmedial line black, wavy, nearing the antemedial toward dorsum, followed by a shade of brown below middle; subterminal line undulate, indistinct, inwardly edged with white towards apex and faintly towards dorsum; black lunules edged with white on termen; fringes grey, paler at ends of the veins. Underside fuscous, paler on costa and termen of fore wings and on termen of hind wings.

Expanse 50 mm.

A male specimen from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.).

Comes near *H. dieckmanni*, Staudinger.

Ozola pica, sp. n.

♂. Head and thorax yellow with black dots; abdomen paler yellow, barred with black. Fore wing white on basal two-thirds, apical third and costal margin to base black, base of wing yellow, a curved series of black dots at one-third from the base; four white spots in the black apical third—three parallel with termen, and one at two-thirds from base. Hind wings white, a black band on terminal area, the outer edge of which is irregular. Fringes of all wings grey, termen black. Underside as above.

Expanse 40 mm.

One specimen from Palali, sub-prov. Benguet, Luzon (2000 ft.), December 26th, 1912.

Comes near *falcipennis*, Moore.

NOTES AND OBSERVATIONS.

ARCTIA CAIA UTAHENSIS, HY. EDW.—I have just received a specimen of this form from Steamboat Springs, Colorado (Orman M. Strange), and on looking up the literature find that Hampson's diagnosis ('Cat. Lep. Phal.', vol. iii) is not quite exact. The hind wings and abdomen are orange, or rather orange-fulvous, the abdomen becoming scarlet basally. As Henry Edwards stated, the bands on the primaries are wider than in the *americana* form. Holland ('Moth Book,' pl. xv.) figured this as *wiskotti*, Staudinger, but the true *wiskotti* is not American, though it appears to represent an independent development along similar lines.—T. D. A. COCKERELL.

PYRAEIS GONERILLA IN NEW ZEALAND.—Having read various more or less interesting notes on *P. atlanta*, from time to time, in the 'Entomologist,' I thought perhaps something about its representative in the Antipodes might be of some interest too. This species is said to be dying out, and as far as the northern portions on the North Island are concerned, there seemed to be a good deal of truth in the

statement. However in the south I saw no signs of such being the case. From what I could gather, this butterfly in the neighbourhood of Wellington and elsewhere seems to be on the wing practically all the year round, but far most abundant in the summer and early autumn. I arrived in Wellington about mid-November where I found the spring extremely cold, but all the same it was not long before I had secured a good number of *gonerilla* larvae, some from the dwarf nettles which grew somewhat sparingly in certain damp situations in some native bush, near Karori (by following the instructions of Mr. H. W. Simmonds), and others on the bush-nettle, a huge, thick plant, which, thanks to information received from Prof. Kirk, of Wellington, I found quite a lot of, down in one gully, near a stream, below some "sheep-trimmed downs." The bush-nettle (*U. ferox*) is a very large member of the Urticæ family; its sting is so formidable as to cause intense numbness to the fingers for several days afterwards. It is being destroyed everywhere as a useless pest, and hence, I suppose, the said diminution in the numbers of *P. gonerilla*, though it is nowhere near extinction at present. The larva varies very considerably; some were nearly black, others almost entirely of a deep cream colour; then again a pale dull green hue was in preponderance, in some cases extremely so, with every intermediate form of it. I also found the pupa, on several occasions, rolled up in the nettle-leaves. The butterflies began to emerge in December, and all I had were out before the middle of January. I bred some dozens of them and could have secured as many more had I wished to. The place where I saw most wild specimens on the wing was Wanganui (in the south part of the North Island) late in January. Here on the banks of the Wanganui River, where *Buddleia* grew in great abundance, on the mauve blossoms of this attractive plant, *gonerilla* was much in evidence; whereas of the other *Vanessa* (*V. itea*), said to be partly accountable for the possible extermination of the former, I saw scarcely a single specimen. I do not know if *Buddleia* is indigenous to New Zealand, or has been imported thither from the old country, but if this is so, I can only say that, like many other imported things, it is doing mighty well in the south hemisphere. Many things which flourish there have been imported, some to the subsequent annoyance of the New Zealander. For instance, the humble bee was found to be a necessary influence in the fertilisation of clover, and was duly imported, with the results that the clover seeds alright, but the bee attacks beans, and riddles holes in them at a certain period of their development, thus causing an immense amount of destruction to the crops. Sparrows are everywhere, and skylarks fill the skies with their songs—in fact, if I am here in the spring, I need only go out into the meadows of England, close my eyes, and feel myself back in New Zealand. Another importation which has flourished amazingly in its new surroundings is the common blackberry; one could almost live on them in the neighbourhood of Nelson. I have never seen such quantities anywhere in Europe, and in size and flavour they were equal to, if not surpassing, the cultivated blackberries of California.—MARGARET E. FOUNTAINE, F.E.S., 126, Lexham Gardens, London, W. 8, September 7th, 1921.

THE LARVAE OF *INO GLOIULARIA*.—Buckler's figures and description do not agree with British specimens. I am indebted to the kindness of Mr. F. G. S. Bramwell for a supply of the larvae of this extremely local moth, and also for pointing out that Buckler's figures and description do not agree with British examples of the larva. The difference is so great that I am inclined to think Buckler, who obtained his larva from continental sources, must have had some other species. When the actual British larvæ are placed before the figures the difference is very striking, the figures having a bluish-green tint, whilst the actual larvæ are without any trace of blue; there is certainly some green, but it is brownish green. The details given by Buckler also do not seem to correspond with those of the larvæ I have seen. The specimens handed to me by Mr. Bramwell came from Hollingbury, near Brighton. The following are the chief points of difference:

As Described by Buckler.

1. Prothorax "greenish with broad black marking or plate tapering towards the front."
2. "Tubercles rather light bluish green."
3. "The dorsal row of markings black."
4. "White sub-dorsal marking; inclines to creamy white, sometimes to yellowish white; this is contrasted strongly below by a broadish stripe of dark green, tapering towards the head."
5. "On the smooth skin are minute black dots."
6. "The side below is entirely dark green."

Hollingbury Larvæ.

1. Prothorax brownish with dark brown marking tapering to front, and some small black dots.
2. Tubercles light brownish grey or putty coloured.
3. Dorsal row of markings dark grey with lighter margins.
4. This stripe is dark putty coloured.
5. I cannot see any signs of these.
6. The side below is dark putty coloured.

It is very difficult to follow Buckler's description, and the above notes must not be taken as an ideal method, but simply as an attempt to indicate the main points of difference. Mr. Bramwell informs me that the larva from the Lewes locality are even more different from Buckler's description than those from Hollingbury, and that they are darker in shade than the latter, with dull flesh colour in the spiracular areas and on the claspers.—W. G. SHELDON.

NOTES ON SECOND AND THIRD BROODS, 1921.—With reference to the note on *Nisoniades tages*, second brood, seen by Mr. W. J. Lucas in the New Forest this year (*antea*, p. 218), I should like to add that I took a freshly-emerged specimen of the above on July 13th last also in the New Forest, which doubtless belonged to a second brood, and which, as noted by Mr. F. W. Frohawk (p. 218), was much more spotted and suffused with cream colour than any I have yet seen. I took third-brood *Polyommatus icarus* between August 27th and September 3rd in perfect condition, and doubtless freshly emerged, including a nice blue female var. *caerulea*, all from one locality near here (Mortlake). The second brood of *Celastrina argiolus* was abundant here during July, and I took several specimens of same, it being specially fond of a small blue flower growing up the wall of a house and also bramble blossom. The spring brood was decidedly

scarce here. The third brood of *Chrysophanus phœas* was out and extremely abundant on August 27th. One could net a hundred or so in quite a short time, var. *cæruleo-punctata* being quite 30 per cent. of those examined. I took an example of *C. phœas* with hind wings of a uniform fawn colour and the copper band very thin. With the exception of *N. tages*, all the specimens mentioned were either seen or taken by me within a short walk of my house.—A. E. STAFFORD; 98, Cowley Road, Mortlake, S.W. 14.

SECOND EMERGENCE OF HESPERIA MALVÆ.—A specimen of this butterfly was captured here on September 6th this year.—N. C. ROTHSCILD; Ashton Wold, Oundle, Northamptonshire.

NISONIADES TAGES, SECOND BROOD.—With regard to the occurrence of a second brood of *Nisoniades tages* during the present season, to which reference was made by Mr. Frohawk and another in the September 'Entomologist,' I have to report that I saw a single specimen on July 19th. On July 30th I took one in battered condition, and again single specimens on August 3rd and August 19th. The one taken on the last date was quite normal and in fresh condition, but the one taken on August 3rd was remarkable owing to its uniformly pale brown colour, which is almost identical in shade to that of the under-side of individuals of the spring brood. The whitish spots on the upper side of the hind wings are very conspicuous, and the under-side much paler than in typical specimens. Unfortunately it is damaged. All were taken in this neighbourhood.—CHARLES M. WOODFORD; The Grinstead, Partridge Green, Sussex.

SECOND BROOD OF *NISONIADES TAGES*.—On July 30th *Nisoniades tages* was common in fresh condition between Bembridge and Sandown. The species occurred up to August 28th—the last date when I had the opportunity of looking for it.—F. W. J. JACKSON; The Pines, Ashstead.

NISONIADES TAGES, SECOND BROOD.—While searching for varieties of *Polyommatus bellargus* on the upper slopes of the Verne Fort, I. of Portland, I took two freshly-emerged specimens of *Nisoniades tages*. This was on August 21st, and several more were observed on the following day.—F. J. KILLINGTON; 1, St. Catherine's Road, Eastleigh.

POLYOMMATUS BELLARGUS AT PORTLAND.—This species is very common on the steep slopes of the Verne Fort. The first specimens—males—were seen on August 14th; two days later hundreds of both sexes were flying there. The only aberration worth remark was ab. *puncta*, with very conspicuous black dots on the margin of the hind wings; several such specimens were taken. The species was also taken on the top of the cliffs near the lighthouse.—F. J. KILLINGTON; 1, St. Catherine's Road, Eastleigh.

COLIAS HYALE AND *PYRAMEIS CARDUI* IN ESSEX.—On September 8th I captured a worn specimen of *Colias hyale*, ♀, flying over a field of lucerne in bloom on Canvey Island, the only specimen seen, which

died a few days after without depositing. Upon examination she had already done so previous to capture, as only a very few ova were found in her body. *Pyrameis cardui* was fairly numerous, feeding on the lucerne blossoms; some in fresh condition, probably bred in the neighbourhood.—F. W. FROHAWK; September, 1921.

COLIAS HYALE AT HAZELEIGH.—This is evidently not a *Colias* year in this neighbourhood. My wanderings in August through the many lucerne fields close by were altogether futile until, on the last day of the month, I came across a freshly-emerged specimen of *C. hyale*. *C. croceus (edusa)* I haven't seen at all, and, as most of the lucerne is now cut, I can hardly hope for any further success this year.—(Rev.) GILBERT H. RAYNER; Hazleleigh Rectory, Maldon, September 7th, 1921.

COLIAS HYALE IN SUSSEX.—I caught a specimen of *Colias hyale* on July 29th last near Pulborough, Sussex. This seems to be an interesting date.—G. H. SIMPSON-HAYWARD; Icomb Place, Stow-on-the-Wold.

COLIAS EDUSA AND *CARADRINA AMBIGUA* IN SOUTH DEVON.—The greater part of August was spent by me at Budleigh-Salterton. While there I saw about half-a-dozen specimens of *C. edusa*. Since coming home I have been up in the Portsdown Hills, where the species was common last year and in 1917, but did not see a single example. I believe that in most years a few specimens are seen at different spots on the South Devon coast, which looks as though in that favoured part of the country the species survived the winter. In the garden of the house where I was staying at Budleigh Salterton was a large *Buddleia*, and each night among a number of commoner things I took specimens of *Caradrina ambigua* flying around or settled at the flowers.—J. E. TARBAT; Fareham, Hants.

CHRYSTOPHANUS PHLEAS SCHMIDTII.—On August 6th I took a specimen of *C. phleas* ab. *schmidtii* on Sheen Common, Richmond. The ground-colour of fore wings and the band on hind wings is creamy, not white, and the band is slightly suffused with orange. I think it is referable to the form mentioned in 'Butterflies of the British Isles.' The second brood of *C. phleas* was abundant on the common, and a third emerged about the last week in August.—S. B. HODGSON; 3, Bassett Road, North Kensington, London, W.

CELASTRINA ARGIOLOUS TREBLE-BROODED.—On Sunday last (September 4th) I noticed two *C. argiolus* gambolling in the air just outside my house, and have seen several specimens flitting about the ivy since that day. As the second brood was out about July 20th these individuals evidently belong to a third brood. The only previous record I have of such an occurrence is in 1911, when September was gloriously hot.—(Rev.) GILBERT H. RAYNER; Hazleleigh Rectory, Maldon, September 7th, 1921.

COENONYMPHA PAMPHILUS VARS.—Whilst collecting specimens of the above near here last month I took two which were different from

the type—one with a “blind” eye spot at the anal angle of each of the hind wings, and the other with four spots or points along the outer area of the hind wings, the points being very small. Can any reader tell me of similar vars. having occurred anywhere?—
AUGUSTUS E. STAFFORD; 98, Cowley Road, Mortlake, S.W. 14.

BRENTHIS SELENE, SECOND BROOD, AGAIN AT ABBOTTS WOOD.—I recorded the appearance of a numerous second brood of *Brenthis selene* in 1920 on p. 18 of the present volume. A note on a similar brood this season may be of interest. It was first seen on July 24th, when my friend, Mr. F. P. Sharp, of Eastbourne, took four. On the 31st he took some fifty during a very short visit. My first visit was paid on August 7th, when about fifty were inspected between 9 a.m. and noon ; they were then showing signs of wear. On the 8th and 10th the weather was unfavourable and I saw but few, and those worn, but on the 14th in a couple of hours in the early morning between fifty and sixty were examined, a good few of which had but recently emerged. As in 1920 a careful search in other parts of the wood where they had been common in May revealed no signs of them. Both years had very early springs (*selene* in 1920, May 23rd, in 1921, May 21st) and sharp frosts in June, which cut down the bracken in the more exposed parts of the woods. Mr. Sharp has suggested to me that these conditions (1920 being the very reverse of 1921 in other respects) might afford an explanation of what is certainly, so far as records go, a most unusual occurrence. To accept this theory support should be forthcoming in the shape of similar records from other localities for both years. Perhaps some of the readers of this note may be able to give the necessary evidence. Did any of the Lewes collectors find a summer brood on the “*Immorata* ground”?—H. WORSLEY WOOD; 31, Agate Road, Hammersmith, W. 6, September 13th, 1921.

POLYGONIA C-ALBUM IN WARWICKSHIRE.—On September 3rd I saw in my garden here a perfect specimen of *Polygonia c-album*. It was easily captured while revelling in the sweets of a decayed apple on the ground. We are not far from the well-known haunts of this pretty species in Hereford and Worcestershire, so it is natural that an occasional specimen should wander into Warwickshire, but I have not heard of it in our county before.—E. GROSE HODGE; The Rectory, Birmingham.

POLYGONIA C-ALBUM IN BERKSHIRE.—I took a specimen of *P. c-album* in Wittenham Wood, Berks, on July 12th last. I have never seen or heard of a specimen from this locality before.—MORRIS J. BOORNE; “The Crossways,” Shillingford, Wallingford.

VANESSA ANTIOPA IN DORSET.—On Tuesday, August 23rd, I noticed a butterfly sitting on a half-eaten apple in the garden and feeding voraciously. Not being quite sure what it was I went to look in a butterfly book, and found it was a Camberwell Beauty. It had gone when I returned, but two days afterwards I found it in the greenhouse, dashing itself against the glass. With the help of a gardener

I caught it in a glass shade, and it was killed and set. I should be much interested to know if many of these butterflies have been seen this year in other parts of the country.—MARY C. BOND; Tyneham, Corfe Castle, Dorset.

[Besides the specimen now recorded by Mrs. Bond, captured on August 23rd last, according to records available, it appears only three other captures have occurred of *Antiope* during the past 44 years in Dorset, viz., one at Branksome in 1877, one at Weymouth in 1884, and one at Swanage in 1918.—F. W. F.]

PAPHIO BIANOR TAKEN AT BRIGHTON.—This butterfly was caught in a net on June 8th, 1918, by Mrs. Chart, flying over a bed of pansies. I have seen the insect, it is a little rubbed, having been carried alive to a firm of naturalists (Messrs. Pratt & Sons) at Brighton, who killed it and set it up in a case. It is an inhabitant of China and Hong-Kong, and resembles ab. *majalis*, the rarer spring type, the blue lines on the lower wings extending to the base of the rounded tails as in ab. *japonica* (Butl.) and *maucki* (Ménér.). How it came to be flying at Withdean, Brighton, is a mystery.—F. G. S. BRAMWELL; 1, Dyke Road Drive, Brighton.

LAMPIDES BÆTICUS AT DOVER.—A friend of mine here showed me a specimen of *Lampides bæticus* taken in his garden. It is a good female specimen. I send you his letter.—G. O. SLOPER; Hotel Burlington, Dover.

Extract from Mr. F. P. Lane's letter.

"The 'Tailed blue' which I showed you on Saturday was caught by my son (Fredk. E. Lane, aged 13) in my garden at the back of Montague Gardens, Castle Avenue, Dover, on August 2nd, 1921. I was in the garden when it was caught. It was first seen on a row of garden peas."

ISSORIA LATHONIA NEAR DORCHESTER.—While working for *A. bellargus* I netted a very fine specimen of *I. lathonia*; judging by its appearance it must have just emerged from the chrysalis. The only other species worth mention was a fine male *Colias edusa*, the only one I have seen this season. Another remarkable capture was *Polygonia c-album* in my garden at Southbourne on July 24th.—A. FORD; 36, Irving Road, Bournemouth.

CYROCALA FRAXINI IN SCOTLAND.—I found a good specimen of *C. fraxini* at rest on a refreshment tent at Bay of Uigg, Kincardineshire, on August 22nd. Another specimen was seen by a young collector early in September at Portlethen, about three miles from where I took my specimen.—L. G. ESSON; 6, Esslemont Avenue, Aberdeen.

NOTES ON THE REARING OF THE LARVAE OF MELITÆA CINXIA.—*À propos* Mr. Mayor's article in this month's 'Entomologist,' I quote from my diary under date September 17th, 1872: "This morning I devoted to hunting for *M. cinxia* larvae. I commenced operations just outside the town of Ventnor to the westward, where I happened

to know the butterfly occurred. I searched every patch of the narrow-leaved plantain I could find, turned over the leaves carefully on my hands and knees, examined all the fields where the plant grew, but without success. I then gave it up as a bad job and walked along the cliff, but I had not gone very far when close to the path I noticed a web attached to a clump of grass, which at first I took to be a spider's web, but on further investigation proved to contain a number of minute larvae which I at once concluded to be those of *cinxia*, at which I was highly delighted; further search resulted in finding four or five more 'webs.' The larvae were in a state of hibernation, the webs being quite closed up. The locality where I discovered them was between the coastguard path and the edge of the cliff—a declivity of about fifteen yards. The plantain grew here in some profusion; some of the 'webs' were 'made up' in the grass close to the food plant, others close to the roots." On March 2nd, 1873, the larvae commenced to emerge from their winter quarters, and I then transferred them to a warmer place in the garden against a wall facing the south, and provided them with an abundance of growing plants of narrow-leaved plantain, which I covered over with muslin. The larvae thrived and grew with great rapidity, but I was amazed at the numbers that emerged from their webs by the hundred, and I felt really sorry that I had collected so many. I had about 300 specimens, no casualties among the larvae and no varieties among the perfect insects. The butterflies emerged from June 8th to July 8th.—A. H. JONES; Eltham, September 2nd 1921.

REARING EUPITHECIA INDIGATA.—Will any of your readers kindly give me their practical experience of rearing the larvae of this species? Buckler illustrates the larva "after final moult, July 18th." Edward Newman says "the larvae are full fed from the middle to the end of July." Barrett says the larvae feed "during June and July," while, on the other hand, L. W. Newman makes the insect partially double-brooded with larvae in June and July, and a partial second emergence in August, but of whose life-history he says nothing. During the past two summers I have endeavoured to rear the insect from the egg. Last year, on Scotch fir, the larvae fed on and on till the end of September, when the last one died, none having pupated. This year I put them on larch and again they have fed continuously till now, and (except that one has pupated) they are still feeding. On two occasions I have beaten in July in the hope of getting full-fed larvae. On both occasions I have only succeeded in obtaining quite small larvae. I consider the larvae very delicate and far from easy to rear.—PERCY C. REID; Feering Bury, Kelvedon, September 5th, 1921.

TRICHOPTERA AND EPHEMEROPTERA IN 1920.—Mr. K. G. Blair, B.Sc., sends me the following note of captures: TRICHOPTERA.—May 14th, *Hydropsyche pellucidula* at Staplefield, Sussex; May 22nd, *Goëra pilosa*, *Notidobia ciliaris* and *Cyrnus trimaculatus*, canal near Uxbridge; June 27th, *Plectrocnemia conspersa* on tree-trunks in Epping Forest, also *Limnophilus sparsus* and *L. centralis*; August

7th, *Limnophilus xanthoides* in a juniper-bush on the top of the downs at Wendover; September, *Limnophilus affinis*, *L. marmoratus* and *L. lunatus*, near Lewes, Sussex. EPHEMEROPTERA.—May 14th, *Ephemera danica*, *Clocon dipterum*, *Centrophilium luteolum* and *Leptophlebia helvipes* at Staplefield, Sussex; May 21st, *Siphlurus armatus*, nymphs at Stanmore Common from which imagines emerged next day and days following (also *Leptophlebia helvipes*); May 22nd, *Ephemera vulgata*, *E. danica* and *Habrophlebia fusca* from canal at Uxbridge.—W. J. LUCAS; Kingston-on-Thames.

CRICKETS AND REFUSE DUMPS.—During the present year two cases have been recorded of *Gryllus domesticus* occurring in the open in association with refuse dumps ('Entom.', liv, p. 127; 'Ent. Mo. Mag.', lvii, p. 185). These dumps were in the neighbourhood of Hatfield and Huddersfield respectively, and it is now possible to add a third instance of the same kind met with in Middlesex. Early in August one of my sisters, Mrs. G. J. Ashby, told me that she had both heard and seen a number of common house crickets on and about an extensive rubbish-heap near West Drayton, and on subsequent occasions she collected several specimens for me. I understand that the refuse composing the rubbish-heap is brought from houses in the west of London, and that some of the materials are destroyed by burning. I do not know when this colony of crickets was first established, but in any case the hot weather of the present year would help them to maintain an outdoor life, and the artificial heat engendered by burning would afford further assistance in the same direction.—HERBERT CAMPION; 58, Ranelagh Road, Ealing, W. 5, September 12th, 1921.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—July 14th, 1921.—The President in the Chair.—Mr. G. S. Baker, of West Brompton, was elected a member.—There was a short discussion on *Xanthorhoea* (*Cidaria*) *rivata* and *X. (C.) alternata* (*sociata*), introduced by Mr. Hy. J. Turner, who dealt at length with the nomenclature and differentiation and briefly with the variation.—Mr. A. A. W. Buckstone exhibited series from several localities and referred to a later and darker form of *X. alternata* (*sociata*).—Mr. Mera, series of both species, and referred to the variation occurring in Britain, dealing especially with the Isle of Lewis dark race of the latter species.—Mr. Enefer read a note on his exhibit of *Hylobius abietis*, a beetle recently becoming abundant in the south of England.—Mr. H. Moore, an ant-lion he had bred from the larva given him by Mr. Main from South France, and also an aberration of *Anosia berenice* from Florida.—Mr. Priske, the unusual winged form of the water Hemipteron *Velia currens*.—Mr. Blair, the fire-fly, *Phengodes laticollis*, from Washington, and read notes on its life-history.—Mr. Turner,

further species of Lepidoptera from California sent to him by Mr. G. B. Pearson.

July 28th, 1921.—The President in the Chair.—Mr. Edwards, various insects taken by him at Digne in April, 1897.—Mr. Main, an example of the second ecdysis form of *Gryllus campestris*; puparia of the tsetse-fly from South Africa, ova of the "Katydid" locust of North America; and a young trap-door spider, *Atypus affinis*, from Epping Forest.—Mr. Ashby, the *Coccinellidae* from the collection of the late Mr. Ashdown, 2220 specimens.—Mr. Goodman, a nest of the wasp *Polistes gallicus* and a larva of *Hyles euphorbiae* from the Dauphiné.—Mr. Farmer said that it was reported that a specimen of the "large copper" has been taken at Limpsfield, and Mr. Edwards suggested that it was possibly an escape from Capt. Purefoy's rearing experiments in Kent.

August 11th, 1921.—The President in the Chair.—Mr. Edwards exhibited apples infested with the apple-scale *Mylelaspis pomorum*.—Mr. Hy. J. Turner, a chrysalis of *Pyrameis atlantica* from Betws-y-Coed, North Wales.—Mr. Blenkarn, *Melanophila acuminata* from Crowthorne, taken from actually burning pine-stumps, *Lebia cyancephala* from Boxhill, *Cassida fastuosa* on *Senecio jacobæe* at Boxhill, *Dianous cœruleascens* from the Mole near Boxhill, *Liparus germonus* on hogweed in Kent, *Aromia moschata* in London, *Bythinus glabratius* in a nest of *Lasius flavus* at Boxhill, etc.—Mr. Ashby, *Stauropus fagi* and *Asthena blomeri* taken at the Chalfont Field meeting.—Mr. T. H. Grosvenor, six distinct shades of blue in *Agriades thetis*, including a unique specimen with scattered black scales, and a very pronounced ♀ ab. *ceronus*.—Mr. K. G. Blair, a living bred *Papilio podalirius* from South France and a *Gryllus bipunctatus* taken in the docks.—Mr. Withycombe, stereoscopic slides of ova of a Hemipteron and of the Tineid *Harpipteryx xylostella*.—Mr. Tonge, a presumably third-brood specimen of *Pararge egeria*, bred from a female captured at Chalfont on June 25th.—Mr. Goodman, two distinct races of *Erebia tyndarus* from La Grave and the Engadine.

August 25th.—The President in the Chair.—Mr. Edwards exhibited the black "cherry-aphis," *Myzus cerasi*, and the greenhouse "white-fly," and referred to the methods of control of the latter pest.—Mr. Turner, a cocoon of *Rothschildia aurota* from which a large imago had emerged, with ova laid by it; a chrysalis of *Papilio thaos*, remarkably resembling a piece of rotten stick; and a pupa of *Eastes magnifica*, pointing out the rough file-like surface characteristic of the genus.—Mr. Withycombe, *Ascalaphus ottomanus* from Digne, a new record for France.—Mr. Coxhead, a dipterous gall, *Oligotrophus corni*, on dogweed.—Mr. Main, in his terrarium the larva of *Necrophorus interruptus* reared from ova; it would probably pupate in the spring.—Mr. Goodman, European species of "coppers" for comparison, *Heodes virgaureæ*, *H. hippothoë*, var. *eurybia*, *Chrysophanus dispar* and var. *rutilus*.—Mr. Coppeard, one of six similar aberrations of *Arctia caja*, in which the usually cream-coloured banding had a beautiful pink flush.—*Hy. J. TURNER, Hon. Editor of Proceedings.*

OBITUARY.

JOHN GARDNER. DIED JULY 21st, 1921.

ONE of the last of the old school of entomologists passed away on July 21st, leaving a great gap in the small circle of north country collectors.

A native of Teesdale and born about the year 1840 he would be over eighty years of age at the time of his death, he removed in early life to West Hartlepool, where he went into business as a timber merchant and rarely left his native county during his long life, preferring to collect and study the local fauna to making trips to the more celebrated localities.

His work, in consequence, was somewhat circumscribed, but with splendid collecting ground on the cliffs at Blaekhalls, Greatham marshes and the wooded denes all close to hand he was never at a loss for interesting work, and to within a year or two of his death he was still turning up species new to his taking.

He was never inclined to write much, and the record of his work is chiefly to be found in the Catalogue of the Lepidoptera of Northumberland and Durham, of which he became the Editor on the death of John E. Robson in 1907; its pages are scattered over from one end to the other with his records and captures, and for local insects there is no one left possessing his intimate knowledge.

Barrett, Buckler and many others were indebted to him for help in their work both with regard to the habits of the perfect insects and for larvae which he discovered, the latter being at all times his favourite method of collecting—indeed if an insect was seen he would never be satisfied till he had done his best to turn up and breed its larva as well.

He was always eager to help the younger generation with information, naming specimens and types, and the writer owes a deep debt entomologically speaking to him for advice and encouragement given freely for over twenty years.

His cabinets were given just before he died to the Hancock Museum, Newcastle-on-Tyne, where the contents will be available in the future for students who may wish to examine the long series of many species which they contain, together with types of nearly all the British species, except a few of the rarest.

His interests were not confined to Lepidoptera as he had a fine collection of local and rare Coleoptera, also at Newcastle Museum, and his garden, though small, was one of the best in the district.

Mr. Gardner was elected a Fellow of the Entomological Society in the year 1890, and continued his Fellowship until the time of his death.

A few years ago threatenings of heart trouble compelled him to give up active work, and he finally passed away through an attack of angina pectoris. He left no children, and the writer's deepest sympathy goes out to his widow after so many years of married life.

JAMES W. CORDER.

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A NEW ABERRATION OF *ARICIA ASTRARCHE*.

BY WILLIAM CARTER.

On July 16th of this year, the occasion of an excursion of the Natural History Society of Northumberland and Durham to Blackhall Rocks, I was fortunate enough to capture a beautiful form of the Brown Argus in the same restricted locality as has produced so persistently the form *redræ*, Harr. Dr. J. W. H. Harrison, who has described so many varieties of this insect (see Tutt, vol. iv, pp. 244-7), has been good enough to help me in this case, and the following is our joint description:

Aricia astrarche, ab. *cuneata*, nov.

This form clearly belongs to the *redræ-albicans* group, but differs markedly from all.

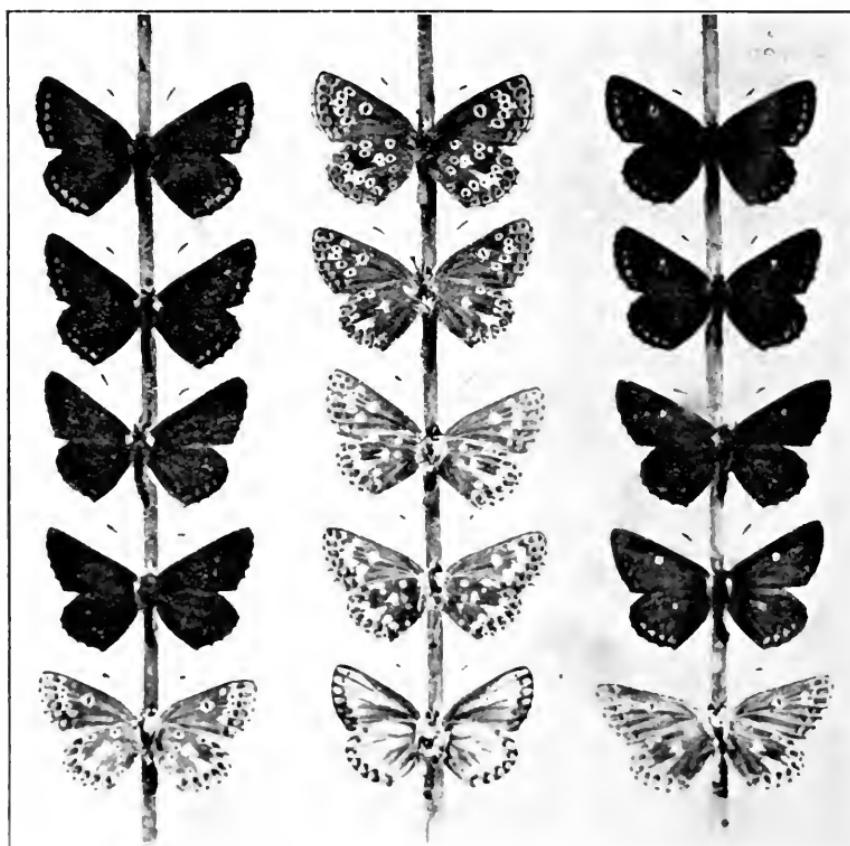
Above, the insect appertains in facies to the var. *semi-allous*, and thus calls for no comment.

Below, the fore wings are ashen grey in the ground-colour, except that the area between the discoidal spot and the upper five of the subterminal row of red spots is intersected by five broad pearly-grey dashes. The red spots themselves are slightly moved inward, whilst the black spots preceding them are progressively obsolescent as we pass from the anal angle to the costa. On the contrary the black spots usually following them are quite obsolete, but in compensation all the veins in that area are marked with a broad blackish bar. Similarly the terminal black line is broader than the normal. On the hind wings the ground-colour is a very slightly ochreous white, whilst the veins over the outward half of the wings are finely outlined in black brown; basally this outlining becomes diffused into the ground-colour to an extent just enough to show that the spot in the cell, although minus its pupil, has the same colour as the main ground-colour. The subterminal row of red spots has its individual members distinctly less than usual, but more concentrated in colour. Before it occur the usual black spots, but, as in the fore wings, those succeeding it are obsolete. Again, as in the fore wings, the veins in the area between the red spots and the fringes are heavily and broadly marked in blackish brown.

Altogether the impression one gains from the fore wings beneath is that they are dark in colour and traversed by pale wedges, whilst the hind wings strike one as being white with brown wedges.

Habitat.—Blackhall Rocks, Co. Durham.

The accompanying illustration shows a series of upper- and under-sides of *astrarche* vars., but for the moment and for the



Photo, Philpott & Son, Ltd., Newcastle-on-Tyne.

purpose of comparison only the under-sides need be specifically mentioned. They are:

First row: ab. *discreta*. Second row: type *astrarche*, ab. *vedrae*, var. *salmacis*, var. *artaceous*, ab. *cuneata*. Third row: ab. *deleta*.

These seven are Durham Coast specimens—in fact fourteen of the fifteen illustrated are from this county.

I hope at a later date to deal with the whole series illustrated.

13, Kimberley Gardens;
Newcastle-on-Tyne.

COLIAS EDUSA, FAB. (*CROCEUS*, FOURC.):
ITS SEASONAL FORMS, VARIETIES AND ABERRATIONS.

By H. ROWLAND-BROWN, M.A., F.E.S.

(Continued from p. 187.)

Besides the aberrations and forms published, and satisfying the formula to some extent, "*pas de bonne figure, pas de nom valable*," I find several others, *e.g.* those, to which no allusion has been made by me, on Mr. Fitch's plate in the 'Entomologist' for 1878. (a) Schopfer also figures ('Iris,' vol. xii, pl. ii, fig. 2, 1899), under *C. hyale*, L. (= *edusa*, F.), a male in which the nervures from the outer marginal band at apex are continued through to the discal spot, giving the example a streaky and smudgy appearance to some extent (probably = *Striata*, Geest (*r*), or very near to it). On the underside, also figured, the black connecting streaks are even more pronounced. The hind wing shows a brownish streak connecting the discal spots with the inner margin, and the spots themselves are very small. The example was taken at Partenkirchen in Bavaria, and the author is to be commended for not having at once labelled it with a fancy name.

(b) Dr. Verity figures ('Rhopal. Palæarct.', pl. xlvi, fig. 35) a ♀ ab. of the *gen. vern.* bred from Hyères larvæ by Mr. Harold Powell of that town. The discal spots on the fore wings are enlarged, and the yellow nervures traverse the marginal bands as in the typical male, while the yellow spots at the margin are reduced and suffused.

The above retained thirty-four varietal and aberrational forms are, so far as I can ascertain, all described to the date of this paper. It is possible, and highly probable, that in Germany and elsewhere the list has been extended during and since the war. If so, I shall be greatly obliged if readers of the 'Entomologist' will refer me to the sources in which such publications have appeared. The system of giving names to local forms, and especially to individual aberrations, is only to be commended where applied throughout a genus in such a way that the parallel range of variation in all the species of that genus is represented by identical nomenclature. *Colias edusa* has been fortunate in this one respect. Its described forms, as to the majority of them, do bear some relation to the variation awarded the dignity of a distinctive name. The names *Faillæ* (*u*) and *Cremonæ* (*l*) alone record the original discoverer, and do not of themselves suggest the particular form concealed under their denomination. On the other hand, among those recently described, however beautiful the name from an æsthetic point of view, names like *Adoratrix* (*f*) are of as little value scientifically as proper names imperfectly latinised. I must plead guilty to having invented

Cinerascens (*g*) : but I feel sure that someone else would inevitably have supplied the deficiency, as soon as detected, and my object in making this one addition to the catalogue, already too long, is to secure uniformity in so far as the naming of a colour form permits of it.

The fact that *Edusa* is not an indigenous species in the United Kingdom increases rather than depreciates interest in its variation. Incidentally, in the western palearctic region it is the most stable species of the *Colias* group, for whereas Mr. Sheldon's observations⁺ and captures in south-east Russia indicate a normal habit of hybridisation among the "pale" Coliads—e.g. *C. hyale* × *C. erate*—there is as yet no recorded instance, I believe, certainly in Britain and France, of hybrid *Edusa* × *Hyale*, although the two species are often on the wing at the same time, haunt the same localities, and must be in frequent contact all over Europe. The problem of the "white" females in *Colias* remains a problem. All that can be hazarded is that the original form of *Colias* female was a pale form, and that the yellow normal form, disclosing a tendency to maleness, has succeeded in dominating the original until it has ousted the ancestral pale form altogether, and itself become the normal. As I remarked at the beginning of this paper, there are localities left in which the proportion of pale to yellow female forms is still pronounced. But they are few and far between; and as the white form appears to be extremely rare in the vernal emergencies—if occurring at all except accidentally—the evolutionary transition of colour form in the female may be considered established.[†]

I trust the compilation which I have made will at least prove useful for reference to students of variation, as well as to collectors anxious to identify and name such departures from the type as they may have encountered in the fields in those golden years—for *Edusa* years are usually golden years for the lepidopterist in every sense—when this adventurous and beautiful butterfly renews its, alas!, fruitless efforts to enrol itself in the little army of true British butterflies.

In conclusion, I wish to express my gratitude and thanks to Dr. Roger Verity, of Florence, Dr. Ubaldo Rocci, of Genoa, and Mr. C. E. Morris, of Le Cannet, Alpes-Maritimes, for the great assistance they have given me throughout, especially in regard to the seasonal appearances and forms observed in Sicily, central and north Italy, and the French Riviera respectively.

Harrow Weald:
January 21st, 1921.

* "An Expedition in Search of Russian Butterflies," 'Entomologist,' vol. xlvi, pp. 270-271, etc., 1914.

[†] Mr. Morris reports two examples of the *gen. vern.* which he refers to ab. *helice* (*in litt.*, October, 1921).

[My revision of this paper has been interrupted by illness. Prof. Cockerell has drawn my attention to certain forms named and described by him ('Entomologist,' xxii. 1889). I hope to deal with these, and to supplement my observations with some interesting notes on the species in 1921 on the Riviera by Mr. Morris, in a future number of the 'Entomologist.'—H. R.-B.]

A LIST OF THE NAMED VARIETIES AND ABERRATIONS OF COLIAS EDUSA, F.

- | | |
|---|--|
| (a) Ab. ♀ <i>Helice</i> , Hb. | (s) Ab. <i>Velata</i> , Ragusa. |
| (b) Ab. ♀ <i>Helicina</i> , Obthr. | (t) Ab. ♂ <i>Atrofasciata</i> , Roccii. |
| (c) Ab. ♀ <i>Pallida</i> , Tutt. | (u) Ab. <i>Obsoleta</i> , Tutt. |
| (d) Ab. ♀ (<i>vel forma</i>) <i>Albissima</i> , Ragusa. | (v) Ab. ♀ <i>Subobsoleta</i> , Roccii. |
| (e) Ab. ♀ <i>Cerulea</i> , Verity. | (w) Ab. ♂ <i>Faillae</i> , Steph. |
| (f) Ab. ♀ <i>Adoratrix</i> , Stauder. | (x) Ab. ♂ <i>Helena</i> , H.-S. |
| (g) Ab. ♂ <i>Cinerascens</i> , Rd.-Brn. | (y) Ab. ♂ <i>Micans</i> , Fritsche. |
| (h) Ab. <i>Brunnea</i> , Tutt. | (z) Ab. ♀ <i>Divisa</i> , Verity. |
| (i) Ab. <i>Flavida</i> , Ksen. | (aa) Ab. ♀ <i>Semidirisa</i> , Roccii. |
| (j) Ab. (<i>vel forma</i>) <i>Fulvostigmata</i> , Roccii. | (bb) Ab. ♀ <i>Internodimidiata</i> , Verity. |
| (k) Ab. ♂ <i>Deserticola</i> , Verity. | (cc) Ab. ♀ <i>Semiobsoleta</i> , Roccii. |
| (l) Ab. <i>Cremonae</i> , Bang-Haas. | (dd) Ab. ♀ <i>Seriata</i> , Roccii. |
| (m) Ab. <i>Chrysothemeformis</i> , Verity. | (ee) Ab. <i>Deannulata</i> , Roccii. |
| (n) Ab. ♂ <i>Passa</i> , Verity. | (ff) Ab. <i>Bimaculata</i> , Verity. |
| (o) Ab. ♀ <i>Melanitica</i> , Verity. | (gg) Ab. <i>Egra</i> , Verity. |
| (p) Ab. <i>Nigrafasciata</i> , Verity. | (hh) Ab. (<i>vel forma</i>) <i>Minor</i> , Verity. |
| (q) Ab. ♀ <i>Suffusa</i> , Tutt. | (ii) Var. <i>Pyrenaica</i> , Gr. Gr. |
| (r) Ab. ♂ <i>Striata</i> , Geest. | (jj) Ab. <i>Ampla</i> , Verity. |

SEASONAL FORMS.

- (i) *Forma vernalis* (*gen. vern.*), Verity.
- (ii) *Gen. ast. Edusa*, F.
- (iii) *Forma Autumnalis*, Roccii (*gen. autumn.*).

SOUTH AMERICAN EUMOLPID.E, MOSTLY OF THE GROUP COLASPINI.

BY FRED. C. BOWDITCH.

(Continued from p. 236.)

Rhabdopterus sulcipennis, sp. nov.

Ovate, broad; purplish bronze; antennæ fulvous; joints 6, 7, 10 and 11 dark; thorax rather thickly, finely and evenly punctulate; elytra strongly subgeminate punctate; the intervals longitudinally costate and convex, strongly so at the apex.

Type, ♀, Prov. Huallaga, Peru, Rio Mixiollo (Baer).

Length, 6 mm.

Stout and broad; head with the transverse and longitudinal impressions not particularly developed; punctuation sparse on

the vertex; thicker between the antennæ, which are of moderate length. Labrum rufous; thoracic punctuation nearly even. A slight foveate depression near the anterior angles; sides nearly evenly rounded, and with a scarcely noticeable subangulation at the middle, and only then at a certain angle. Elytra with well-marked foveate depression below the shoulder; the punctures in strong semi-geminate rows, becoming single when the heavy sulcation begins towards the apex; all the punctures and reflexed margins are obsoletely metallic green; below and legs dull purplish black, tinged with bronze.

Nearly allied to *peruvensis*, Jac.

Rhabdopterus ignotus, sp. nov.

Medium sized. Ovate, broad, shining bronze; below, with legs almost black; thorax irregularly, mixed punctate; coarsely and semi-aciculate at the sides; elytra strongly, at the sides coarsely punctate; semi-seriate on the disc and striate towards the apex.

Type, ♀, Callanga (?) Peru (second Jac. Coll.).

Length, 5.5 mm.

Stout; head rather closely punctate, especially on the lower front; wide frontal and well-marked longitudinal foveas, taking the places of the usual depressions. Antennæ rather short; rufous, joints more or less tinged above with black; thorax broad, with a wide reflexed margin; sides subangulate at the middle; surface with scattered, ill-defined smooth areas, especially at the middle, with a well-marked broad depression each side behind the middle; the coarse punctures are almost entirely confined to the sides; elytra with deep transverse depression below the shoulder. The punctuation is much like what I have identified as *cupriurus*, Lef., from Caracas; the reflexed margins and punctures are more or less obsoletely metallic green; closely allied to *peruvensis*, Jac., and to *sulcipennis*, supra.

Rhabdopterus punctatissima, sp. nov.

Small, rather elongate. Below rufous; breast darker; above brownish rufous; the thorax and elytra overlaid with metallic plumbeous lustre; feet dark purplish, with bases of femora and tibia rufous; thorax very densely, evenly and finely punctulate; antennæ rufous; joints 7, 9, 10 and 11 dark.

Type, ♂, ♀, Paramba, 3500 ft., February, 1897, dry season (Rosenberg).

Length, 4.5 mm.

Head finely but not very thickly punctate; the usual cross depression not deeply marked, and the longitudinal in the ♀ much more strongly indicated than in the ♂; thorax almost without depression; the punctuation very fine and almost even;

the lateral edge narrowly reflexed, and obsoletely metallic green. Elytra broadly, obsoletely depressed below the shoulder, strongly punctate; subseriate next the suture and costate at the apex; the latter feature as usual most pronounced in the ♀, which also has a more or less well-defined costa from the shoulder to the apex; the reflexed margin is obsoletely metallic.

Rhabdopterus rosenbergi, sp. nov.

Small, stout. Below very dark brown, almost black; above dark æneous bronze, shining. Legs dark brown, with middle of the femora rufous; thorax transverse, much widened at about the middle; sides nearly straight from the base to the middle, then abruptly narrowed to the front, giving the appearance of sub-angulation; elytra (♀) with sides covered with irregular tubercles and rugosities.

Type, ♀, Cachabè, low c., November, 1896 (Rosenberg).

Length, 4.5 mm.

Head smooth, except for a few fine punctures on the epistome; the cross depression strong; the vertex smooth, impunctate or nearly so. Antennæ rufous? (four joints missing): thorax rather obsoletely collared in front, and excessively finely and obsoletely punctulate; elytra with well-marked transverse depression; finely seriate punctate, obsoletely costate at the apex. The sides and more or less of the discal and basal parts broken up into series of irregular smooth tubercles or rugæ, which has the effect of breaking the seriate punctuation; the reflexed margin and the punctuation is obsoletely metallic in a strong light. The smooth thorax and tubercular elytra are different from any other known to me.

Podoxenus distortus, sp. nov.

Æneous bronze, the elytra with a rufous tinge, so they do not appear as golden as the thorax, which, in both sexes, especially in the ♂, is very much puffed up or swollen; transverse, and strongly angulate at the middle side, the surface shiny and finely punctured; elytra are coarsely, semi-seriately punctate, transversely rugose on the sides, costate and tuberculate at the apex; the anterior and middle tibiæ of the ♂ so bent inwards as to seem almost useless for walking.

Type, ♂ and ♀, Ribeirao, Pires, San Paulo, Brazil, 11-19 (Gounelle).

Length, 7 mm.

Head rather sparsely punctured, with well-defined transverse and poorly-defined longitudinal marks; calli smooth and large; antennæ rufous, barely reaching the middle of the elytra; the thorax is margined all around, the punctuation becoming sparser towards the sides, especially the hind angles in the ♂; the scutel

is smooth and rather truncate; elytra with obvious transverse depression where the punctures are enlarged, becoming foveate, especially in the ♀; the legs are aeneous with tibia dark rufous, shading off into lighter on the apex and tarsi; the upper rear edge of the front ♂ tibia has a comb or fringe of long golden hair, very noticeable; the curve at the end of the ♂ middle tibia is almost semicircular.

A very extraordinary form, and showing all the generic characters abnormally exaggerated.

Boston, Mass., U.S.A.

THREE NEW STEPHANIDÆ FROM JAVA.

By E. A. ELLIOTT, F.E.S.

Stephanus pilosus, sp. nov.

♂. There are sparse white hairs on the head, longer and denser on the petiole and apex of abdomen. The pleuræ are covered with dense white pilosity, and on the legs, the hairs, though less dense, are longer and more conspicuous.

Frons, vertex and occiput strongly areuate rugose; one strong carina between the posterior ocelli and two behind them; ocellar space depressed. Posterior margin of head broad and slightly reflexed. Cheeks and temples smooth, with a few setiferous punctures. Second flagellar joint fully twice as long as first, third a little longer than second. Prothorax transcarinate; semiannular smooth and laterally hairy. Scutellum centrally smooth, lateral lobes coarsely rugose-punctate. Mesonotum coarsely transcarinate. Propleuræ finely, mesopleuræ coarsely punctate. Metapleuræ and median segment ciliate punctate, and separated by a strong carina, which is anteriorly somewhat rugose, posteriorly smooth and shining. Petiole trans-striate, basally more coarsely, shorter than rest of abdomen, which is smooth. Hind coxae stout, coarsely transrugose; femora smooth, bidentate, the teeth long and acuminate; tibiae as long as femora and trochanters, strongly compressed in basal third.

Black; head, scape and apex of anterior femora red, frontal tubercles apically black. Wings slightly iridescent; fore wings centrally, hind wings apically infumate; stigma and nervures black-brown.

Length, 22 mm.; abdomen, 14½ mm.; petiole, 6 mm.

Hab.—Palabuhan, Ratoe. M. E. Walsh (ex Frisby), February 22nd, 1916. Type in coll. Claude Morley.

In the coarse sculpture and conspicuous pilosity this species much resembles *S. villosus*, Kiell.

Stephanus rugosus, sp. nov.

♂. Frons areuate rugose; vertex and occiput with strong longitudinal carina, occiput regularly, vertex less regularly areuate striate;

three strong carinæ behind posterior ocelli. Posterior margin of head bordered. Cheeks slightly shorter than scape, smooth; temples smooth. Second flagellar joint twice as long as first; third slightly shorter than first and second together. Neck of prothorax transcarinate, semiannular smooth with a few punctures. Propleuræ finely trans-striate. Mesonotum apically smooth, central row of punctures distinct, the smooth space on each side with a single puncture before and behind, laterally strongly punctate, separated from the scutellum by two carinæ. Scutellum centrally smooth, laterally strongly rugose-punctate. Metapleuræ and median segment ciliate punctate, separated by a strong carina. Petiole strongly transrugose, shorter than the remaining smooth segments. Hind coxæ coarsely trans-striate; femora smooth, bidentate; tibiae slightly longer than femora, compressed to middle.

Black; head, except apices of mandibles, and apex of thorax above red; anterior legs more or less rufescent. Wings hyaline.

Length, 16 mm.; abdomen, 10 mm.: petiole, $4\frac{1}{2}$ mm.

Hab.—Java, Preanger Regency, near Seekoboemi. M. E. Walsh, 1918. Type and cotypes in coll. Claude Morley.

This species bears a superficial resemblance to *S. unicolor*, Schlett, and to *S. ducalis*, Westw., but differs considerably in sculpture.

Fenatopus variidens, sp. nov.

♀. Frons and ocellar space very finely striate; vertex and occiput transversely, almost arcuately striate. Posterior margin of head strongly bordered. Cheeks slightly shorter than scape, smooth; temples smooth. Second flagellar joint one and a half times as long as first, third nearly as long as first and second together. Prothorax finely trans-striate, neck elongate, apically above deeply excised. Mesonotum irregularly rugose-punctate, central row of punctures distinct; scutellum centrally smooth, lateral lobes punctate. Mesopleuræ smooth; metapleuræ and median segment ciliate punctate and not separated. Petiole finely trans-striate, slightly shorter than rest of abdomen. Terebra longer than body, black, with a white band 3 mm. broad before the 1 mm. broad black apex. Hind coxæ trans-striate; femora smooth, tridentate; tibiae slightly longer than femora, compressed almost throughout.

Black; head ferruginous, frons darkest, inner orbits and anteriot frontal tubercles paler; vertex, including ocellar space, and occiput black. Front tibiae and tarsi, base of intermediate femora, their tibiae externally and apical tarsal joints rufescent, metatarsus white. Hind legs entirely black except the middle and apical femoral teeth, which are white. Wings iridescent, nervures pale brown, stigma centrally translucent.

Length, 16 mm.; abdomen, $9\frac{1}{2}$ mm.: petiole, $4\frac{1}{2}$ mm.; terebra, 18 mm.

Hab.—Paleboehan, Ratoe. M. E. Walsh (*ex* Frisby), February 22nd, 1916. Type in coll. Morley.

The colour of the femoral teeth is distinctive. In *F. rugiceps* the basal tooth is white and the apical black; on the present species this is reversed.

THE MACRO-LEPIDOPTERA OF COUNTY TYRONE.

By THOMAS GREER.

(Continued from p. 208.)

Coremia (Ochyria) ferrugata, Clerck.—Kane notes that this species is plentiful at Favour Royal and Altadiawan, where an extreme striated form occurs, abundant in E. Tyrone, but less common than the preceding, ochreous forms near Lough Fea.

Coremia (O.) designata, Hufn.—Fairly abundant in damp woods, Favour Royal and Altadiawan (K.), Killymoon, Lissan and at Stewartstown.

Amorpha viridana, Fb.—Abundant almost everywhere.

Maleneydris salicata, Hb.—Locally abundant at Altadiawan (K.), common on rocky ground near Lough Fea, where ab. *unicolorata*, Gregson, occurs, bogs near Cookstown.

Maleneydris multistrigaria, Haw.—Widely distributed and common in the county: ab. *virgata*, Tutt, at Lough Fea.

Maleneydris didymata, L.—Very abundant, dark forms on the bogs.

Opuria (Epurrita) dilatata, Bork.—Common in woodlands; banded forms approaching ab. *latifasciata*, Prout., at Killymoon and Baronscourt.

**Opuria (E.) christyi*, Prout.—Locally abundant in birch woods near Cookstown and Stewartstown.

**Opuria (E.) autumnata*, Gn.—Very local in woods at Killymoon.

Venusia cambrica, Curt.—Local, at Altadiawan and Favour Royal (K.).

Eutephria cesiata, Lang.—Abundant on the mountains and moorlands; pale forms with dark central fascia near Lough Fea.

Xanthorhoe montanata, Bork.—Very abundant everywhere; a form approaching var. *shetlandica*, Weir., is not uncommon.

Xanthorhoe fluctuata, L.—Common and widely spread, but rare on the uplands, where the last species is often abundant; several ab. *costorata*, Haw., and dark forms are common.

**Xanthorhoe galata*, Hb.—Very local on sandy ground at Washing Bay, Lough Neagh: examples taken here have the central band dark purplish black; ab. *unilobata*, Haw.

Xanthorhoe (Epirrhoë) sociata, Bork.—Very abundant everywhere.

**Xanthorhoe (Euphyia) univittata*, Haw.—Kane states that

this species is very local and uncommon, but no doubt it has been much overlooked, as it is locally abundant and widely spread in this district (East Tyrone), some examples having the white stripe slightly tinted with ochreous. Localities: Lissan, at Cookstown, Killymoon, and very common near Stewartstown; larvæ on *Galium palustre* as well as *Stellaria*.

Eulype hastata, L.—Kane met with this species at Altadiawan.

Mesoleuca albicillata, L.—Locally abundant in woods where *Rubus idaeus* is common, Favour Royal (K.), Lissan, Killymoon, near Stewartstown, and at Lough Neagh.

Mesoleuca ocellata, L.—Local, but often abundant; sometimes very numerous in woods carpeted with *Galium sylvaticum* at Lough Fea.

Mesoleuca bicolorata, Hufn.—Abundant among alders; ab. *plumbata*, Curt., a form near this, at Stewartstown.

Perizoma affinitata, St.—Not uncommon locally; Kane records a form from Altadiawan with the waved band partly obsolete, and of a brown tint. Other localities are: Favour Royal, larvæ near Cookstown (H.), Killymoon abundant, and at Loughry; the majority of the local specimens are referable to ab. *turbaria*, Step.

Perizoma alchemillata, L.—Locally abundant at Favour Royal (K.), Lough Fea (larvæ on *Erica cinerea*), Cookstown, near Stewartstown and Lough Neagh.

**Perizoma flavofasciata*, Thun.—Fairly abundant in May and June, near Killymoon and at Loughry; larvæ on *Lychnis diurna* near Cookstown (H.).

Perizoma albula, Schiff.—Abundant in meadows.

**Perizoma bifasciata*, Haw.—Locally abundant and widespread in this district; imago swarming among *Bartsia* near Cookstown (H.); a variable series bred from larvæ, near Grange; Stewartstown and Lough Neagh.

**Perizoma adæquata*, Bork.—Rare, near Lough Fea.

Perizoma tenuata, St.—Kane took this species not uncommonly at Favour Royal and Altadiawan.

Cumptogramma bilineata, L.—Abundant everywhere, ab. *infuscata*, Gumpt., common on moorlands and bogs.

Hydriomena impluriata, Hb.—Locally abundant among alder, varying from pale green to brown. Kane records a whitish suffused variety from Altadiawan. Other localities are: Lough Fea (H.), Lissan near Killymoon and at Stewartstown.

Hydriomena sordidata, Fb.—Very abundant among sallows; moorland form at Altadiawan (K.), and at Lough Fea.

Hydriomena ruberata, For.—Kane records this species as rare at Favour Royal; abundant in this district, and pupæ common under bark of willows and sallows, near Stewartstown, Lissan, and at Lough Neagh; larvæ on *Salix cinerea*, *S. caprea*, and *S. aurita* near Cookstown (H.).

Anticlea baliata, Hb.—Abundant everywhere in April.

Anticlea nigrofasciaria, Göze.—Locally common and widely distributed; several with central area whitish.

Eupithecia oblongata, Thub.—Not uncommon, larvæ on ragwort (H.).

Eupithecia pulchellata, St.—Abundant, especially in the Lough Fea district; larvæ common on *Digitalis*.

Eupithecia indigata, Hb.—Recorded by Kane from Altadiawan; rare in pine woods at Lissan.

Eupithecia venosata, Fb.—Local, but not uncommon near Grange, and at Killymoon; larvæ in seed-capsules of *Selene inflata*.

Eupithecia distinctaria, H. S.—Kane took this species at Favour Royal.

Eupithecia assimilata, Dbl.—Rare at Favour Royal (K.); a few in gardens, Stewartstown.

Eupithecia absinthiata, Clerck.—Generally abundant, larvæ on mugwort, *Artemisia vulgaris*, and ragwort.

Eupithecia goossensiata, Mabl.—Locally abundant on heathery ground.

**Eupithecia albipunctata*, Haw.—Not very abundant, larvæ on *Angelica sylvestris* at Lough Neagh and near Tannamore.

Eupithecia austera, Hüb.—Widely distributed but not very common.

**Eupithecia virgaureata*, Dbl.—Rare; a few larvæ on *Solidago virgaurea*, and ragwort at Lough Fea.

Eupithecia lariciata, Fr.—Kane took this insect abundantly at Altadiawan.

Eupithecia castigata, Hb.—Very abundant.

Eupithecia satyrata, Hb.—Abundant on the moorlands and bogs; often swarming in ravines on the mountains: whitish grey forms near Favour Royal (K.).

**Eupithecia succenturiata*, L.—Kane found this species very local and scarce generally; not uncommon in the district, near Grange, and at Killymoon; var. *disparata*, Haw., has occurred at the former locality. Larvæ often abundant on mugwort, *Artemisia vulgaris*, but much subject to the attacks of parasites.

**Eupithecia sulphurata*, Haw.—Locally abundant and widely spread; the imago on ragwort, near Grange, Lissan; at Cookstown (H.), and near Stewartstown.

Eupithecia haworthiata, Dbl.—Taken at Favour Royal by M. F., *vide* Kane.

**Eupithecia plumbeolata*, Haw.—Not common near Lough Fea, and at Lissan.

**Eupithecia pygmaea*, Hb.—Common in a damp meadow near Grange, underlaid by magnesian limestone, also at Lissan, and near Stewartstown; larvæ on *Cerastium*.

Eupithecia tenuiata, Hb.—Not uncommon among sallows.

Eupithecia nanata, Hb.—Abundant and widely spread on the bogs and mountains.

Eupithecia abbreviata, St.—A common insect at sallow catkins.

**Eupithecia dodoneata*, Gn.—Rare, near Stewartstown; a few larvae from hawthorn.

Eupithecia exiguata, Hb.—Generally common and widely spread among hawthorn.

Gymnoseclis pumilata, Hb.—Kane remarks of this species, “everywhere numerous”; vary rare in this district.

Chloroclystis coronata, Hb.—Widely distributed, but not very common, also at Favour Royal (K.).

Chloroclystis rectangularis, L.—Not uncommon in gardens and orchards, and in woods and hedgerows among crab apple.

Pelurga comitata, L.—Common on the margins of cultivated fields and on waste ground.

Cenocalpe vittata, Bork.—Locally abundant in marshes and damp meadows.

Boarmiinae.

Abraxas grossulariata, L.—Generally abundant; one pale yellow aberration bred. In certain localities on the moorlands the larva feeds on ling, *Calluna*, and the imago is small and dark.

Lomaspilia marginata, L.—A common species among sallows; at Killycolpy Wood on Lough Neagh, this moth sometimes occurs in hundreds among the undergrowth, and ab. *pollutaria*, Hb., is not rare.

**Ligdia adustata*, Schiff.—Locally abundant among *Euonymus europaeus*, but almost confined to carboniferous limestone districts in the vicinity of Cookstown, Tullyhogue, and Stewartstown.

**Bapta tenerata*, Hb.—Another local species, but often abundant among blackthorn scrub near Stewartstown; also common on bogs near Tamnamore, the larva in this locality feeding upon birch.

Cabera pusaria, L.—Very abundant everywhere.

Cabera exanthemata, Scop.—Common in damp localities. Kane notes a form from Tyrone (probably from Favour Royal), with the cross-lines joined near the costa on both wing and with a shaded patch at the junction.

Numeria pulveraria, L.—Local in woodlands, but widely distributed in the county; at Altadiawan and Favour Royal (K.), near Lissan, Stewartstown and Lough Neagh.

Ellopia (Hylea) prosapiaria, L.—Often abundant in pine woods, as at Favour Royal (K.), Lissan, near Killymoon, and Killycolpy Wood.

Metrocampa (Eudalimia) margaritaria, L.—Common almost everywhere in woods.

(To be continued.)

A SUPPLEMENTARY NOTE ON MACEDONIAN
DRAGONFLIES.

By HERBERT CAMPION.

MR. K. J. MORTON has been good enough to favour me with some additional observations upon the Odonata collected in Macedonia by Dr. J. Waterston (see 'Entom.', vol. li, 1918, p. 128, and lii, 1919, p. 202).

It seems that the *Calopteryx virgo* of the country, of which specimens were taken at Stavros, belongs to the race *festiva*, Brullé, which was itself described from the South of Greece. In this variety the wings of the male are uniformly dark, and without the paler area at base and apex which is found in British individuals.

Of still greater interest is the discovery in the collection of a fourth species of *Orthetrum*. This is *O. albistylum*, Selys, a rare insect readily distinguished in both sexes and in all stages of development by the whiteness of its anal appendages. The single male and female were taken at Giol Ajak, near Milovci, July to August, 1917, and were accidentally placed among the examples of *O. cancellatum* taken in the same year. Re-examination of the second female included in the same record shows it to have been correctly referred to the commoner species.

It may be useful to add to these remarks the dimensions, which have not been published before, of the ten specimens of *Selysiothemis nigra*, Lind, in the same collection.

From Giol Ajak, July to August, 1917 :

		Abdomen.	Hind wing.
♂	No. 1	22·5	27·0
♂	No. 2	22·0	27·0
♂	No. 3	22·5	27·0
♀	No. 1	20·5	27·5
♀	No. 2	19·5	27·0

From Lake Adjı Geul :

♀ No. 1	20·5	28·5
♀ No. 2) June 18th to 19th,	21·0	27·5
♀ No. 3) 1918	20·5	27·0
♀ No. 4)	21·5	27·5
♂ , August 4th, 1918	22·0	26·5

A NOTE ON SOME DRAGONFLIES FROM AMBOINA.

By HERBERT CAMPION.

THROUGH the kindness of my friend Dr. Hugh Scott, I have had an opportunity of examining a small collection of Odonata

from Amboina, belonging to the University Museum of Zoology, Cambridge. These Dragonflies were obtained by Mr. Frederick Muir during his visit to that island in the year 1908, and as soon as caught they were immersed for a time in hot alcohol with the object of preserving their natural colours. To a considerable extent this object has been achieved, although the colours have obviously undergone a certain amount of bleaching.

According to a recent faunistic catalogue ('Nova Guinea,' xiii, Zool. (2), pp. 117-128, 1915), *Pseudagrion microcephalum*, Ramb., has not been known previously to occur in the Moluccas at all, while *Xiphiaigrion cyanomelas*, Selys, *Teinobasis superba*, Hagen-Selys, and *Trithemis festiva*, Ramb., are now specially recorded for Amboina for the first time.

Subjoined is a list of the species represented in the collection :

CALOPTERYGIDÆ.

Rhinocypha terminata, Selys, 4 ♂, 1 ♀.

AGRIONIDÆ.

Caconeura moluccensis, Selys, 7 ♂, 2 ♀.

Agriocnemis femina, Brauer, 3 ♂, 1 green ♀, 1 orange ♀. This record has been published by Dr. Ris ("Suppl. Entom." No. v, p. 23, 1916).

Xiphiaigrion cyanomelas, Selys, 2 ♀.

Pseudagrion coriaceum, Selys, a series of males and females.

Pseudagrion microcephalum, Ramb., 2 ♂, 2 ♀. This species ranges from Bombay (the type locality) to Eastern Australia, and its occurrence in Amboina was not unexpected. I have compared a male and female from Mr. Muir's collection (the latter, however, rather discoloured) with Indian material of both sexes from Goa and Lake Chilka, kindly lent to me by Dr. F. F. Laidlaw. A close general agreement was found to exist, except in the matter of the superior anal appendages of the male, which are, of course, considerably broader in the Amboina specimen than in the examples from India. The various forms assumed by those appendages in *Ps. microcephalum* have been fully discussed by Dr. Ris (*loc. cit.*, pp. 40-42, 1916), but the appendages of the specimen before me do not strictly correspond with any of the figures given by him.

Teinobasis superba, Hagen-Selys, 1 ♀. For this identification I am indebted to the kindness of M. René Martin.

LIBELLULIDÆ.

Nannophlebia lorquini, Selys, 2 ♂, 3 ♀.

Nannophya pygmaea, Ramb., 1 ♂.

Neurothemis stigmatizans manadensis, Boisd. 2 ♀.

Trithemis festiva, Ramb., 1 ♂.

Dr. Scott has been good enough to make arrangements whereby some of these interesting Dragonflies have been acquired by the British Museum (Natural History).

ABISKO AND BOSSEKOP REVISITED.

By ALBERT F. ROSA, M.D.

WHEN giving my experiences and recording the species of diurni I had met with while on a journey in Arctic Scandinavia in 1919 ('Entom.', liii, pp. 109-115, and p. 131 *et seq.*), I had occasion to express regret that I had been unfortunate in being rather late for several of the more important species. This circumstance, which might happen with the most carefully-planned expedition, might depend entirely upon the forwardness of the season, or be due to unavoidable and unforeseen delays, and where several districts far removed from one another are included, it is almost certain that there will be some of the desired species on the wing at the same time in at least two of the localities included in the trip.

At the best, one rarely visits any region, and returns with a complete series of examples of all the species and varieties previously recorded; but, so far as Scandinavia is concerned, the season is so short and the facilities for travelling so favourable that it is rather extraordinary what can be done even in a very limited period of time.

So finding myself still short of several species, and in other instances rather deficient as to numbers of specimens, I thought a second round of these most interesting localities would be well worth making.

As I was later in starting than on the previous occasion, I had to pass Jemtland so as to be in advance of my former date. Crossing to Gotenburg, and stopping one day at Stockholm, I went right on to Abisko, where I arrived on June 16th, and found the district thawing after a severe snowstorm which had lasted several days during the previous week.

This state of affairs was greatly to my advantage, because I found the different species just emerging, and I was able on my first day, which was bright, to obtain specimens in the finest condition.

The temperature was very low, and there were no mosquitoes at this time. The smaller lakes were covered, or partly so, by a sheet of ice. The mountains were much whiter than on my previous visit, and snow patches still existed at a low elevation, as, for instance, along the line of the railway and even lower than the route to Bjorklidén by the side of the träsk.

Colis verdundi was not fully out, but made up in freshness

for its deficiency in numbers. *Brenthis freija* was in good condition, and it was not difficult to pick out examples newly on the wing, and *Erebia lappona* was just beginning to appear.

My second day was a blank for want of sunshine, but the third day was fine, and I was able to secure as many examples as I wanted of the species then on the wing. The variation of *werdandi* was much more marked than the year before, several males having the dark margin very faintly indicated. In other cases the series of oblong marks forming the marginal row was very strongly marked and the interspaces filled in with black, forming a continuous black marginal band. All degrees could be taken between these two forms.

Reindeer were common in the park, and I was a little surprised, on stepping through some bushes into the open, to find myself amongst a herd of twenty to thirty, the velvet still on their immature horns. They each made off in a series of graceful bounds as soon as they had recovered from their apparent astonishment.

I left Abisko on the 19th, and went to Bossekop, where I arrived on the night of the 22nd-23rd. When sailing north, a Danish couple, hearing where I was going, altered their journey. Originally intending to go to Vadso, they had telegraphed for rooms at Bossekop, but on nearing their destination a reply was received saying there was no place where they could put up, and that the people of Bossekop did not want visitors.

This was rather disconcerting to them because they had just to return by the same boat, and to me also because I had hoped to stop at the hotel myself. I was sorry they had not spoken to me about it before embarking on the little steamer to Alten.

When landing I soon picked out Dr. Gjessing, wading about amongst the passengers on the fore-deck. He gave me a hurried welcome, saying he would "think about it." No conveyance could be got on hire, but, through the influence of the doctor, the minister's gig and pony were forthcoming, which the owner—whom I had met the year before—said he was pleased to let me have, and I was taken to Jorahl', where I ultimately got most comfortable rooms at a neighbouring farm about 2 a.m.

I was up betimes, and found the meadow facing the farm one of the most productive for *Colias hecla*—which was then just beginning to appear—that I had yet stumbled across. I only observed six on that, my first, morning; but next day, on going out, I got about a dozen in a few minutes, and every day while there I commenced operations by taking a short series.

I got one ♂ unusually strongly washed with violet, and another of a canary yellow colour, ab. *jöra*, n. ab.

Erebia polaris was newly out, and I found here very large *E. lappona* (48 mm.) and ab. *pollux*, Esp., which were also in the finest condition. (*Eneis norna*, some very large, were often seen

flapping about, carried along by the strong wind, and *Chrysophanus* var. *hypophleus* also turned up here, but more ruddy than those taken at Hammerfest the year before. I also got some *Brenthis pales* var. *isis*.

During the few days I remained at Sletten, which was the name of the farm, my attention was centred on the moors intervening between the road and the Skadavaara, but the skies were often overcast during the principal part of the day, and the result of these incursions was anything but encouraging. The ground was very difficult to traverse; wide detours had often to be made to avoid the deeper swamps; the mosquitoes were terrific in their onslaughts. Occasionally a *Brenthis* would appear and disappear, without giving an opportunity to approach, and more rarely an *Erebia* would lure one into the deeper water, without so much as a chance of a sweep of the net.

For certain entomological reasons I wanted to be back at Abisko again as early as possible, so planned to leave Sletten on the Sunday, when "mine host" had agreed to drive me down to Bossekop.

On my last day, which commenced very dull during the forenoon, I made a last search in quest of *E. disa*, and at a point where the marsh crosses the main road I got *Brenthis* var. *ingal*, *B.* var. *ossianus* and *B. treija* commonly, and added *B. frigga* to my list, several of which were taken during the glimmers of sunshine. As the day brightened I made a detour to the left, and found *E. disa* sparingly (7 in all) but not in good condition in some of the swamps, which with little exaggeration might be termed lakes, dotted with tussocks of grass, springing from somewhere below, which give little or no support, and as the insect flies over the surface, one has just to go in up to the knees to get within reach.

As arranged, I was driven down to Bossekop on Sunday morning (27th), and during the forenoon wandered back to the farm down by the river. *C. hecla* was common in the meadows, still quite perfect here, and *E. polaris* by the side of the river. There are two rather curious forms of this, one which has a somewhat lighter ground-colour, greenish brown with dark dots scattered rather regularly over the surface, which gives them a peculiar granular appearance. The other form has symmetrical, pale, more or less wedge-shaped blotches on all the wings towards the medio basal area. It is astonishing how frequently these two forms occur: one might almost say it is difficult to obtain specimens that are what one might consider normally unicolorous. All look very black when on the wing.

E. norna was frequently seen and taken, especially on the moors between the Alt-n clv and Bossekop village, and at the ford referred to in my former paper I saw my first Scandinavian *Melitaea*, which was quickly secured and proved to be a male of *M. iduna*.

I recognised the insect at once by its *Melitaea*-like flight, its dark colour and the white spots which identify it. It more closely resembles *M. aurinia* than it does *M. cynthia*, but there are no black dots in the submarginal series of fulvous spots, upper- or under-side. The pale (white) markings are more prominent on the under-side, and there is a strong black line separating them from the fulvous markings, which are much more restricted than in *M. maturna*. I was sorry I failed to locate its headquarters, though I had a good search all over the neighbouring ground.

I had dinner at the hotel, which was wholly occupied by Dr. Gjessing and his family while he was flitting from the district to Bodø, and I there was introduced to Dr. Wessel, who is the Fulkeslaege (chief doctor) in Finmark.

Dr. Gjessing was referring to my visit to Lapland when the elder gentleman asked me in English if I had taken '*charicle*', and further showed his knowledge of the subject by inquiring if I had met with *iduna*, although no names had been mentioned.

The company was augmented by the arrival of the minister and one of the local dignitaries, when the sounding of the siren warned us of the arrival of the boat. The steamer left at 5 p.m. and I was back in Abisko in the evening of June 30th.

(To be continued.)

NOTES AND OBSERVATIONS.

PRODENIA LITURA, F.—Having observed this widely-distributed species at Funchal, Madeira, last December, I was led to look up its bibliography. To my surprise I find that the name will not hold, as it is based on *Noctua litura*, Fabr., 1775, not of Linné, 1761. We cannot revert to the commonly used name *littoralis*, Boisd., but must take up *Noctua histrionica*, Fabr., 1775—a quite suggestive name. The species, then, becomes *Prodenia histrionica*. At Villa Baleira, Porto Santo, in January, I took a quite ordinary *Xylina exoleta*, L. This genus is new to the Madeiran Archipelago.—T. D. A. COCKERELL.

EUVALESSA ANTIOPA IN SUSSEX.—In the evening of Saturday, August 20th, I left home for a short holiday. After lunch I went down the garden to see my head gardener to ascertain if there was anything to speak about before starting. He told me that he had seen a butterfly disporting itself over a large herbaceous border in the kitchen garden, and which was different to any he had ever seen before. He said it was a large, nearly black butterfly with a white edge all round. I asked him to stay where he was while I fetched a net and glass-topped box, and to watch it if he saw it again. I returned in about ten minutes, when he told me that he had seen it while I was away, and that it sat with its wings extended on a melon frame, but that it had gone again. We walked up and

down for quite half-an-hour when it came back, flew about the herbaceous border and then settled in an apple tree. I got close to it, tried to net it but the branch balked me. It flew wildly about for a few moments and again settled on another apple tree. This time I was more fortunate, and had secured the only Camberwell Beauty that I had ever seen alive in this country. It is a beautiful specimen. I set it before starting, and it is now safely in the cabinet. The next best British specimen in my cabinet was found by my wife. She entered a cottage near St. Osyth's in Essex to escape a heavy shower. In the fireplace she saw a sheet of brown paper with unset butterflies pinned all over it for a summer decoration. Among the Peacocks, Red Admirals, etc., she saw a Camberwell Beauty, which the old lady in the cottage told her she caught with the other butterflies in her front garden. The specimen had not, of course, been set out, but simply pinned through the body with the wings extended upwards at an angle of about 45 degrees. After telling the old lady that the insect was rare and valuable, and giving her a small present, she told my wife that if she would leave our address she would send some more. Needless to say this promise has never been fulfilled. Why the species is so rare in this country I cannot understand, as I have often seen it abroad, e.g. in Norway, South Europe, Canada, etc.—FREDERICK J. HANBURY; Brockhurst, East Grinstead.

CHYSOPHANUS PHLEAS, VAR. ALBA, IN SUSSEX.—Baron J. A. Bonek informs me he captured on May 26th last a perfect specimen of *Chrysophanus phleas*, var. *alba*, on his shoot near East Grinstead, where he found *phleas* common, and also succeeded in taking several light-coloured examples, as well as different forms of var. *ceruleopunctata*. Although *C. phleas* has occurred abundantly in certain restricted areas in various localities during the past month or six weeks, it has been exceedingly scarce in S.E. Essex in places where it is usually abundant. The scarcity is due to insufficient food supply for the larvae, owing to the dried-up state of all low-growing herbage, including dock and sorrel, through the continued drought. In this part of Essex no rain sufficient to moisten the ground fell between April 17th and September 11th, resulting in great destruction of insect life.—F. W. FROHAWK; October, 1921.

PYRAMEIS ATALANTA AND P. CARDUI IN LANCASHIRE.—*P. atlanta* has been extremely abundant in the Witherslack district this season, and also around Preston. Some 150 butterflies which I bred from larvae collected in these two districts produced a few specimens of ab. *fracto* and other minor vars., the colour of their bands varying from dull orange in the case of one specimen to deep carmine. One specimen had the marginal band on the hind wings shading off from the normal colour to yellow on the margins of the wings. The butterflies were plentiful here on the flowers of Michaelmas daisies, and I took a specimen of the ab. *klemensiewiczi*, Schille, on September 10th quite near home. On September 17th and 18th, at Witherslack, I found *atalanta* swarming on some patches of Scabious, there often being seven or eight on the flowers within the space of a square yard. A careful search for varieties resulted in only one of any

note being secured out of many hundreds which were examined while they sunned themselves on the flowers. This was a specimen taken on September 17th with the fore wings asymmetrically marked, the left fore wing having a large broad projection from the inner edge of the red band near its middle, reaching half-way down towards the middle of the hind margin, exactly as we see in *P. indica*, in other respects and the right side entirely as usual in *atalanta*. *P. cardui* larvae were plentiful on thistles at Witherslack in late July. I collected about 150, and the resulting butterflies included two or three with very dark hind wings, very little of the light ground colour being seen in one or two cases. The butterflies were common on September 17th and 18th, but by no means as abundant as *P. atalanta*.—T. M. BLACKMAN; 27, East View Terrace, Fulwood, Preston, October 6th, 1921.

PYRAMEIS ATALANTA IN BERKSHIRE.—In view of the interest attached to *P. atalanta*, it may be worth recording that this butterfly is very much in evidence along the banks of the Kennet at present. Apparently this species was uncommon here during the summer, as my earliest record is September 4th.—A. STEVEN CORBET; Sidmouth Street, Reading, October 5th, 1921.

BRENTHIS SELENE, SECOND BROOD, IN HAMPSHIRE.—In reply to Mr. H. Worsley Wood's query in the October issue of the 'Entomologist,' the following notes may be of interest: I specially looked for second broods of *Brenthis selene* in all its known localities in the Southampton district both in 1920 and in 1921. In the former year not a single specimen was met with, but this year in one locality there has been a numerous second brood, first seen on July 21st, which was, I think, almost as plentiful as the spring emergence: while in another locality eight or ten specimens only were found. It is worthy of notice that there was no second brood seen in any one of the many localities in woods. May I add, while on the subject of second broods, that on October 3rd I took at light one specimen of *Ourapteryx sambucaria*, of which five others since have been taken, while on October 4th I took one *Porthesia similis* ♂ also at light, of which species I have since taken four others, all males and very much smaller than usual.—WM. FASSNIDGE; 47, Tennyson Road, Southampton.

EVERES ARGIADES IN THE NEW FOREST.—While in the New Forest last August my son captured what he at the time supposed to be a specimen of *Argiolus*, but when he came to set it up discovered that it was *Argiades*. As this seems to be a very rare species I thought the record might be interesting.—W. ARTHUR LONG; 21, Guy Road, Beddington, Croydon.

SATYRUS MEGERA TREBLE-BROODED.—I first noticed the second brood of this butterfly (at Hazleleigh in Essex) on July 17th this year, and from then for about a month longer it was quite common; after that only one or two very worn specimens occurred. Judge of my surprise, therefore, when I noticed a fresh male in my garden at the Rectory on September 24th. During the next few days I

observed several quite freshly-emerged specimens, and among them on September 28th a paired couple, of which the female was carrying the male. A third emergence of this Satyrid in England I imagine to be quite unparalleled.—(Rev.) GILBERT H. RAYNER; The Lilaes, Brampton, Huntingdon, October 9th, 1921.

[I saw two or three specimens of this species on the Essex coast, between Clacton and St. Osyth Marsh, each day from September 28th to October 6th this year.—R.S.]

COLIAS HYALE IN KENT. On September 6th I caught one specimen of *Colias hyale* at Westgate in a lucerne field. During my fortnight's holiday I did not see any more *hyale*, although the weather was superb, but *Pyrameis cardui* and *Chrysophanus phœas* were fairly common.—H. O. WELLS; Inehquin, Epsom, September 27th, 1921.

DEIOPEIA PULCHELLA IN LONDON.—On October 9th I captured a specimen of *Deiopeia pulchella* in Regents Park, London. It was flying close to the ground and settling frequently on grass stems. Although it moved on whenever I got near it never flew more than a few yards before dropping into the grass again, so I succeeded in boxing it at last. The specimen is a male and in perfect condition.—C. N. HUGHES; 178, Clarence Gate Gardens, Regents Park, N.W. 1.

DEIOPEIA PULCHELLA AT EASTBOURNE.—I think it may interest you to know that I have captured a specimen of *Deiopeia pulchella*. I found it on a football ground in bright sunshine, and was about to leave it for a cabbage white, when I noticed its peculiar flight and secured it, though badly damaged. H. PHILLY; Aldro School, Eastbourne, October 11th, 1921.

NOTES ON *SPilosoma urticae*.—In May and June last I reared a series of *Spilosoma urticae*, the specimens ranging from forms without or with but one spot on the fore wings to those more or less spotted. Amongst the latter is a specimen which attracted notice by reason of the spot markings not being symmetrical. With eyesight not so good as it used to be, I found the male specimens not easy to distinguish at first sight from the female, there being a not very great difference between the antennæ of the two sexes, although when viewed through a magnifying glass such difference is quite apparent. When so viewed the asymmetrical specimen to which reference is made above was found to be an hermaphrodite, the right antennæ being male, the left female. On August 13th one specimen emerged, the ovum having been laid in June.—ALAN DICKITT; Willow Lodge, Christchurch, October 11th, 1921.

Porthesia similis IN OCTOBER.—It may interest readers of the 'Entomologist' to know that two freshly emerged examples of *Porthesia similis* (*auriflava*) were captured to-day *in cōpula*.—N. CRAYLES ROTHSCHILD; Ashton Wold, Oundle, Northamptonshire, October 8th, 1921.

TRIPHÆNA PRONUBA, AB.—On July 23rd this year I took a specimen of this moth at rest in the house. Colour of fore wings a very deep chocolate-brown; the usual markings can be seen, though some of them are indistinct. Hind wings smoky black, darker in the black borders and pale smoky yellow at bases. Thorax and body same colour as fore wings. The whole of the underside dark, with purplish tinge.—H. O. HOLFORD; Elstead Lodge, Godalming.

OURAPTERYX SAMBUCARIA IN OCTOBER.—Whilst collecting at ivy blossom on the evening of October 10th I captured a Swallow-Tailed Moth (*Ourapteryx sambucaria*) in fairly good condition—I presume a second emergence.—S. N. CHARTRES; 4, King's Drive, Eastbourne.

ABERRATIONS OF COCCINELLA BIPUNCTATA.—In walking from Harrow to Pinner on September 20th last I had occasion to cross a footbridge over the North-Western Railway. On the brickwork at one end of this bridge a large number of ladybirds were noticed, whilst others were alighting thereon. Curiosity induced me to examine the specimens, with the result that I selected twenty aberrations in about half-an-hour. These were ab. *bisculata* (7), *unifasciata* (1), *inæqualis* (2), *annulata* (1), *pantherina* (2), *b-pustulata* (4), and *f-maculata* (3).—RICHARD SOUTH; 4, Mapesbury Court, Brondesbury, N.W. 2.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—October 5th, 1921.—The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc., President, in the Chair.—The President announced that owing to the illness of Mr. H. Rowland-Brown, M.A., Dr. H. Eltringham, M.A., D.Sc., F.Z.S., had kindly consented to act as Secretary for the remainder of the session.—The Treasurer called attention to two portraits that had been bequeathed to the Society by the late Dr. Longstaff.—A vote of thanks to Mr. J. J. Joycey, F.L.S., F.Z.S., F.R.G.S., for his generous gift of a lantern to the Society was passed unanimously.—The following were elected Fellows of the Society: Messrs. Charles L. Fry, 1621, Vallejo Street, San Francisco, California; William F. N. Greenwood, Lautoka, Fiji; Henry W. Dobson, 14 16, Finkle Street, Kendal; Kalidos D. Shroff, Nahani, Surat, India; Arnold Roebuck, Edgmond, Newport, Salop; the Rev. J. Wesley Hunt, 116, Cross Street, Kroonstadt, Orange Free State; and Miss Amy Castle, Assistant Entomologist, Dominion Museum, Wellington, New Zealand.—*Exhibits*: Mr. E. E. Green, F.Z.S., communicated an extract from his journal on the habits of the bee, *Anthidium manicatum*.—Mr. T. L. H. Grosvenor exhibited some British species of *Zygæna*, and remarked on the results of crossing certain species and varieties.—Dr. Cockayne, M.A., F.R.C.P., commented on the question of

the identity of *Zygæna tutti*.—Prof. E. B. Poulton, D.Sc., F.R.S., etc., exhibited an example of *Danaida chrysippus* that had been captured and subsequently rejected by a young shrike in South Africa; he also exhibited on behalf of Dr. R. C. L. Perkins, F.R.S., a collection of terrestrial insects taken from the stomach of a trout in Devonshire. Mr. M. E. Mosely expressed surprise that such a large amount of surface-food had been taken.—*Papers*: The following papers were read: "On *Boreus hyemalis*," by Mr. C. L. Withycombe; "Some apparently new S. African Genera and Species of the Family Pyralidae," by Mr. A. T. J. Janse; "The African Species of the Genus *Neptis*, Fab.," by Dr. H. Eltringham, D.Sc., M.A., F.Z.S.; "The Number of Joints in the Antennæ of Haliphilidae and Paussidae (Coleoptera)," by Mr. T. G. Sloane; "Observations on the Structure of some Homoneura, including the Diagnosis of Two New Families of Lepidoptera."—Mr. A. T. J. Janse gave an account illustrated with lantern-slides on methods of collecting insects when travelling in S. Africa.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—September 8th, 1921.—Mr. K. G. Blair, B.Sc., F.E.S., President, in the Chair.—Mr. H. Moore exhibited a nest of *Vespa germanica* from Kent, with 1052 dead wasps, another 100 or 200 in the nest and several dozen grubs still alive.—Mr. T. H. Grosvenor, several hybrid Zyganids from *Z. trifolii* taken in cop with *Z. hippocrepidis*, various forms of *Z. trifolii*, including ab. *nigricans*, ab. *obscura*, a white specimen, very large and very small specimens, confluent spotted forms, with minute sixth spot, with wide border to hind wings, etc., and of *Z. filipendulae*, very large and very small forms, confluent spotted forms, several fine yellow forms, etc.—Mr. Hy. J. Turner, males and females of race *poseidon* and race *hecuba* of *Ornithoptera priamus* from Queensland and Key Island respectively.—Major Cottam, the chalk form of *Plebeius aegon* from N. Kent, *Euchloris cardamines* with yellow hind wings, very pale *Hypocrita jacobaeæ*, etc.—Mr. Syms, *Chrysomela graminis* from Yorkshire and *C. banksi* from the Isle of Wight.—Mr. K. G. Blair, the living larva of the sawfly *Eriocampa orata* with its waxy secretion, and the living subapterous grasshopper *Leptophyes punctatissima*.—Numerous reports were made on the season and a discussion took place on immigration.

September 22nd. The President in the Chair.—The evening was devoted to the demonstrations on a long series of lantern-slides by various members—Mr. H. Main, slides of the various phases in the life-history of the oil-beetle *Meloe proscarabaeus*, a parasite in the larval stage of the *Anthophora* bee. Practically the whole of the details of the biology of the beetle were illustrated.—Mr. Withycombe, slides showing the habit, structure, growth and development of the bladderwort, *Utricularia*, which entraps small crustaceans and larvae in water, and of *Pinguicula*, which captures and digests small insects by means of its leaves.—Mr. G. T. Lyle, slides of details of Lepidopterous structure, habits and development.—Mr. Bunnett, slides of various larvae and imagines, etc.—Mr. Dennis, a slide of the ova of a *Cimex*, sp., etc.—Hy. J. TURNER, Hon. Editor of *Proceedings*.

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SEVEN NEW MOTHS FROM THE PHILIPPINES.

By A. E. WILEMAN AND RICHARD SOUTH.

Pangrapta (?) albistigma, sp. n.

♂. Head and thorax greyish brown; abdomen greyish brown, ringed with darker except on anal segments. Fore wings pale brown, suffused with darker and traversed by three blackish bands, the outer two curved and almost parallel; reniform and orbicular white. Hind wings whitish with blackish discal dot and broad terminal border. Underside paler, markings fainter, but discal spot of hind wings black and followed by a dusky curved line.

♀. Rather paler in colour.

Expanse: ♂, 28 mm.; ♀, 30 mm.

Two specimens from Manila, prov. Rizal, Luzon (sea level). The male was captured on July 19th, and the female on August 23rd, 1912.

Lælia (?) nitida, sp. n.

Head, thorax and abdomen white; antennæ pale brown, shaft white; front legs pale brown. Fore wings silky white. Hind wings and underside of all wings white.

Expanse: ♂, 32-36 mm.; ♀, 44 mm.

Two males from Palali, subprov. Benguet, Luzon (2000 ft.), December 28th, 1912; a female was secured at the same place two days earlier.

Comes nearest to *L. impressa*, Snelen.

Nygma argenticornuta, sp. n.

♂. Head and thorax brownish buff, antennæ pale brown with whitish shaft; abdomen brownish buff, paler towards tip. Fore wings yellowish buff, with silvery markings between veins on terminal area. Hind wings above, and underside of all wings paler.

♀. Agrees with the male except in having the hind wings fuliginous with pale buff fringes; it is also larger. Underside fuliginous with pale buff margins.

Expanse: ♂, 22 mm.; ♀, 32-34 mm.

One male and two female specimens from Kolambugan, subprov. Lanao, Mindanao (sea level). The male taken June 16th, and the females May 26th and 30th, 1914.

Allied to *N. fulvonigra*, Swinhoe, from the Solomons.

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AA

Nygma philippinensis, sp. n.

δ . Head and front of thorax straw yellow, rest of thorax tinged with purplish brown. Abdomen purplish brown, yellow towards tip. Fore wings straw yellow, basal patch purplish brown, tornal spot black. Hind wings and underside of all wings yellowish white.

Expanse: 32 mm.

A male specimen from Palali, subprov. Benguet, Luzon (2000 ft.), December 26th, 1912; and a male (type) from Kolambungan, subprov. Lanao (sea level), May 16th, 1914.

Comes near *N. cheela*, Swinhoe, from Singapore.

Nygma biguttulata, sp. n.

δ . Thorax chocolate brown, head and front of thorax paler, antennæ brown; abdomen blackish, anal segment yellowish. Fore wings chocolate brown, a white spot at lower angle of cell and one below on vein 1; fringes marked with white at ends of the veins. Hind wings blackish brown on basal two-thirds, terminal third yellow. Underside as above, but without white spots on the fore wings.

Expanse: 68 mm.

A male from Palali, subprov. Benguet, Luzon (2000 ft.), December 27th, 1912.

Allied to *N. praecurrents*, Walker.

Nygma flaromarginata, sp. n.

δ . Head, thorax and abdomen pale purplish brown; antennæ pale brown. Fore wings pale purplish brown, apical area yellow, enclosing a black dot near apex, a yellow patch on termen above tornus. Hind wings pale purplish brown, termen broadly yellow; fringes of all wings yellow. Underside pale yellow, clouded with purplish brown on disc of fore wings.

Expanse: 22-24 mm.

Two male specimens from Palali, subprov. Benguet, Luzon (2000 ft.), December 25th, 1912.

Near *N. scintillans*, Walker.

Nayoda cardinalis, sp. n.

δ . Head, collar and pectus crimson; thorax and abdomen fuliginous. Fore wings fuliginous. Hind wings hyaline, costa broadly fuliginous, dorsum broadly blackish; termen narrowly blackish. Underside as above.

Expanse: 31 mm.

A male from Palali, subprov. Benguet, Luzon (2000 ft.), December 28th, 1912.

THE NORTH AMERICAN SPECIES OF *ORNEODES*.

By E. MEYRICK, B.A., F.R.S., etc.

LORD WALSINGHAM first recorded *O. heradactyla* from the United States, and this identification has been accepted until

recently, and confirmed by other records. In 'Ent. Mo. Mag.,' vol. lv, p. 108 (1919), I recorded *O. Huebneri* from Canada. A careful monograph of the *Pterophoridæ* of North America, with joint authors, Barnes and Lindsey, has just been published ('Contributions to the Natural History of the Lepidoptera of North America,' vol. iv, no. 4); to this is attached also the family *Orneodidæ* (under the name of *Alucitidæ*), including (in the judgment of the authors, who had copious material) one species only, which they term *Alucita montana*, Cockerell, with some hesitation as to its distinctness from *hexadactyla*; they had apparently not noticed my record of *Huebneri*. The name *montana*, Cockerell, has no validity; Cockerell never described it, and in the only reference quoted ('Ent. Mo. Mag.,' vol. xxv, p. 213) he is actually not even proposing the name, but withdrawing it as synonymous with *hexadactyla*. Dr. Lindsey has, however, been good enough to send me four Californian specimens from the material used for his paper; these are unquestionably not *hexadactyla*, and after careful and detailed comparison with *Huebneri* (of which, besides my European examples, I have a series from South Africa, a specimen from Kashmir, and two from Canada), I have satisfied myself that they cannot justly be discriminated from it. There is in the species some variability and diversity of colour and marking, and the scale-thickening of the dark band on the terminal joint of palpi is also rather variable, but I am unable to detect any constant distinction associated with particular regions, and the variation is no more than might be expected in so wide a range of distribution. My conclusion from the above evidence is, then, that there is only one North American species known at present, and that this is *Huebneri*. The apparent absence of endemic species in North America is curious and unexpected, since the genus is fairly well represented in South America, and the geographical origin of these latter species becomes a difficult problem; it may probably be African.

Synonymy of North American Pterophoridæ.

In the careful paper to which I have referred above I notice certain species which the authors, whose studies have been generally restricted to the North American fauna, have failed to recognise as known elsewhere. Feeble as is the flight of the *Pterophoridæ*, not a few species are nearly cosmopolitan in range, apparently without suspicion of artificial introduction. I had already called the attention of the authors to one or two cases of identity, which are incorporated in their paper, but the following are additional corrections.

Platuptilia crenulata, Barnes, is a synonym of *brachymorpha*, Meyr., which occurs throughout Africa, Southern Asia, and the Hawaiian Islands.

Platyptilia marmorodactyla, Dyar (of which the authors kindly sent me six specimens), is a synonym of *fuscicornis*, Zell., common in South America and the Hawaiian Islands. I note also that one of Walsingham's figures of *cosmodactyla* ('Pterophoridae of California and Oregon,' pl. ii, fig. 4) is certainly this species, the different position of the scale-tooth of hindwings and other characters being accurately given.

Pterophorus (Oidæmatophorus) liuis, Barnes, is a synonym of *Lienigianus*, Zell., ranging through Europe, Southern Asia, Africa, and South America.

I take the opportunity to add my decided opinion that *shastæ*, Wals., and *fragilis*, Wals., are synonyms of *Platyptilia albida*, Wals. (examples were also sent me) : the authors, whilst keeping them separate with hesitation, produce no distinctions that I should consider of specific value, and admit that apparently all three forms occurred in a long series from the same locality ; we do not find in nature three distinct but indistinguishable species occurring together.

Thornhanger,
Marlborough.

NOTES ON THE SYNONYMY OF *DIONE MONETA*, HÜBN. AND *D. GLYCERA*, FELD.

BY ARTHUR HALL, F.E.S.

Dione moneta was first figured by Hübner (1820-26), his type being probably from South Brazil. The species occurs in three slightly but distinctly different subspecies, two of which are very common in collections, whilst the third, which happens to be the typical one, is rather rare, and this fact has caused considerable confusion in its synonymy.

Doubleday and Hewitson (1848) gave a figure which seems to represent the Central American race.

Butler (1873), having apparently never seen typical *moneta*, thought that Hubner's figure was intended to represent the species afterwards described by Felder as *D. glycera*, and so re-named *moneta* as *D. poeyii*. He united the Central American and Andean races under this name, but as he specifically refers to Doubleday's figure, the name *poeyii* may stand for the Central American race.

Salvin and Godman (1882) correctly identified the species, although evidently a little puzzled by the absence of typical specimens, as they suggest that Hübner's figure is bad, whereas it is in fact very good. They also unite the Central American and Andean races under the name of *moneta*, and treat *poeyii* as a synonym.

Stichel (1907) correctly separates the species into three races, giving the name *butleri* to the form occurring in Venezuela,

Colombia, Ecuador and Peru, but he wrongly assigns Costa Rican specimens (which belong to *poeyii*) to *butleri*, and gives the locality of true *moneta* as Bolivia and Upper Amazon, whereas specimens from those districts are in fact referable to *butleri* or are intergrades.

Seitz (1913), who seems doubtful about the distinctness of *D. moneta* and *D. glycera*, has figured *poeyii* under the name of *butleri*, and refers to *poeyi* (*sic!*) as a Cuban form in which the fore wings have the discal area lighter! This is altogether wrong, for I can find no record of Cuban specimens of *moneta* and much doubt whether the species occurs in that island.

It is remarkable that none of the above-mentioned authors seem to have known of the existence of *D. moneta* in the area which the typical form actually does inhabit, namely, Northern Argentina and the extreme south of Brazil. This typical form differs from the other two races in the much lighter colouring of the upper surface, the base of the fore wings being scarcely or not at all darker than the discal area and the discal black spots being vestigial or absent. In January, 1920, I met with it sparingly near Santa Maria in Rio Grande do Sul, and in the following month I found it very abundant at Salta in N.W. Argentina at elevations of from 2000 to 3500 ft. Many of these specimens agree absolutely with Hübner's figure, thus disposing of the idea that the latter was intended to represent *D. glycera*, but a few of the Salta examples are transitions towards the form *butleri*, although never so dark as those from Colombia and Ecuador. The butterflies have a flight similar to that of the larger *Argynnis*, but frequent flowers by the roadside and damp places on the ground; they are never found in the dense forest. In Colombia I have taken the form *butleri* at an elevation of 4500 ft., and rarely near Caracas at 3500 ft., but in both countries it probably occurs much higher. In Central America the form *poeyii* occurs, according to Godman and Salvin, from near sea-level up to 8000 ft., but personally I have never met with it below 3000 ft.; on the other hand I once took several examples on the Volcano of Cartago in Costa Rica at nearly 10,000 ft.

D. glycera is a very similar but smaller species of much more restricted range, occurring only in Venezuela, Colombia, Ecuador and Peru. The type was from Venezuela, and Stichel has recently separated the Colombian race under the name of *Gnophota*, but the characters upon which this is founded are so slight that it is doubtful whether the name can be maintained. Specimens from Ecuador and Peru are in any case similar to those from Colombia. The species is found as low as 3000 ft. in Western Ecuador (Huigra), and as high as 8000 ft. above Medellin in Colombia, flying at the same time of year as *moneta* var. *butleri*. Whether *D. glycera* is fully distinct from *D. moneta*

can only be determined when the early stages are known, but as the records seem to show conclusively that it cannot be either a geographical, seasonal or elevation form, it is probably a good species.

The principal synonymy of the two species will therefore be as follows:

1. *D. moneta*, Hrbn., Samml. Ex. Schmett., ii, p. 20 (1820-26).
D. poeyi, Weym., Stett. Ent. Zeit., 1894, p. 320.
 S. Brazil; N. Argentina; Paraguay.
 (a) *D. moneta butleri*, Stichel, in Wytsman's Genera Insectorum, pt. 63, p. 19 (1907).
D. poeyii (part), Butler, Ann. Mag. Nat. Hist. (4), xii, p. 227 (1873).
D. moneta, Staudinger, Ex. Tagf., i, p. 87 (1887).
D. glycera, Kirby (non Felder), Cat. Diurn. Lep. Suppl., p. 724 (1877).
 Venezuela; Colombia; Ecuador; Peru; Bolivia.
 (b) *D. poeyi*, Butler, Ann. Mag. Nat. Hist. (4), xii, p. 227 (1873).
Agraulis moneta, Doubl., Hew. Gen. Dinon. Lep., t. 22, f. 1 (1847); Godman and Salvin, Biol. Cent. Am. Rhop., i, p. 171 (1881).
D. butleri, Seitz, Am. Lep., i, pl. 81, fig. E 5 (1913).
 Texas; Mexico; Central America.
 2. *D. glycera*, Felder, Wien. Ent. Mon., 1861, p. 102; Seitz, Am. Lep., i, p. 402 (1913).
Agraulis moneta, Boisduval (non Hübn.), Spéc. Gén. Lep., i, pl. 10, fig. 7 (1836); *Dione moneta*, Kirby, Cat. Diurn. Lep. Suppl., p. 724 (1877); Seitz, Am. Lep., i, pl. 81, fig. F 1, 2 (1913).
D. glycera gnophota, Stichel, in Wytsman's Gen. Ins., pt. 63, p. 20, pl. 2, fig. 4 (1907); Seitz, Am. Lep., i, p. 402 (1913).
 Venezuela; Colombia; Ecuador; Peru; Bolivia.

DESCRIPTIONS OF THREE NEW BUTTERFLIES FROM COLOMBIA.

BY ARTHUR HALI, F.E.S.

Actinote elena, sp. nov.

Exp. ♂ 2½, ♀ 2½ in.

Allied to *A. surima*, Schaus, and *A. perisa*, Jord. Wings very pale yellow, highly transparent, with scarcely any traces of a dark marginal border. Fore wings with macular discal band almost as in *A. surima*, but its upper portion distinctly separated from the bar at the end of the cell; bar at middle of cell distinct. Hind wings with the discal band more macular than in *surima*, the spots composing it rounder, a small blackish streak in the cell. Underside as above, but paler, the markings fainter.

Habitat.—El Baldio, Colombia. ♂ ♀.
The sexes are alike.

Eresia callianthina, sp. nov.

Exp. ♂ 1 $\frac{1}{2}$ in.

Upper-side shining dark blue, the margins black. Fore wings with a large trifid basal patch of pale red, filling the whole of the cell, the basal half of the lower median interspace, and part of the middle median interspace, the part within the cell interrupted by a narrow black bar. Hind wings with the lower half of the inner margin red as far as the lower median branch. Underside yellowish brown with black veins and rays; red patch of fore wings more extended.

Habitat.—Santa Elena, W. Colombia, 8000 ft. 2♂ ♂.

Nearest to *E. neria*, Hew., but differs in its blue ground-colour and red inner margin of hind wings. It is a good mimic of *Actinote callianthe*, Feld., together with which it flies. My specimens were taken in July.

Eueides crystalina, sp. nov.

Exp. 2 $\frac{3}{8}$ to 2 $\frac{3}{4}$ in.

♂ ♀. Allied to *E. heliconioides*, Feld., but larger. Fore wings with the bone-yellow discal band broader than in *Heliconioides*, but lying wholly outside the cell, a few specimens only having a small dot of this colour within the cell: a red streak below median vein and another on inner margin. Hind wings with a broad median band of bright scarlet, occupying nearly half the wing, the outer edge of the band nearly semicircular and slightly serrated. Underside almost as in *E. heliconioides*, but the band of fore wings much broader and differently formed; hind wings with two submarginal series of small white spots.

Habitat.—Crystalina, W. Colombia, 1100 ft. (June and July).
14 ♂ ♀.

This species differs from *E. heliconioides* and its allies in the broad and solid red band of the hind wings, which is even broader than in *E. ricini*, L. It resembles *Heliconius clysonymus* on the wing, but I did not observe the latter species in the same district.

A FURTHER NOTE ON *COLIAS EDUSA*, FAB. (*CROCEUS*, FOURC.): ITS SEASONAL FORMS, VARIETIES AND ABERRATIONS.

By H. ROWLAND-BROWN, M.A., F.E.S.

By an oversight I omitted in my paper on *Colias croceus*, etc., to refer to the several notes on the species published by Prof. Cockerell in his papers "On the Variation of Insects" ("Entom.", vol. xxii, 1889), e.g.—

(q) His var. *suffusa* is not Tutt's *suffusa* (1896). It is described as similar to the male figured in Newman's 'British

Butterflies from the Bond Collection with the central area only of all the wings suffused with smoky brown, whereas Tutt's is a ♀ form "with strongly suffused base." Tutt's *suffusa* is, therefore, *nomen occultum* and requires reconsideration. There are several smoky blotched examples in the Lowe Collection, but the apparent aberration here is due, I think, to some chemical process during relaxation.

(n) Ab. ♀ *pseudomas*, Cockl. (1889) = *obsoleta*, Tutt; the latter, therefore, falls to it.

Prof. Cockerell's vars. *majus* and *minus* are not described in detail, and I see no reason to retain as separate forms in the strict sense. They are mentioned (*op. cit.*, p. 176) merely as instances of size variation.

On the other hand, my list must be extended and amended as hereunder in the light of his nomenclature:

(kk) *Micans*, Fritsche = *purpurascens*, Cockl. (*op. cit.*, p. 3), and is Fitch's ('Entom.', vol. xi) unnamed form, "beautifully shot with purple or blue." *Micans*, Fritsche, thus falls to the earlier name, while Konas, *micans*, if retained at all, should be limited to examples where the hind wings only are lustrous. Looking through my own collection I observe that, whereas the rosy lustre vanishes from *edusa*, it appears to be permanent in *hecla* and (purple) in *Aurorina heldreichi*, and probably others of the group.

(ll) Ab. *duplex*, Cockl. "Upper wings like *helice*, lower typical; or left side typical, and right *helice* ('Entom.', vol. xi, p. 52, and August, 1876)." Cp. Fitch's plate, 'Entomologist,' vol. xi, figures fifth in both columns.

(mm) Var. *angustior*, Cockl. Wings narrower and longer in proportion than in type (*op. cit.*, vols. xi and xxii, p. 148).

In conclusion I may add that I have a curious ab. of *helice* in which a series of white indeterminate scratches takes the place of the normal pale blotches in the black margin of the left upper wing, the right being normal. This example was taken by the late Rev. F. E. Lowe at La Granja, Spain, in June, 1908.

October 28th, 1921.

ABISKO AND BOSSEKOP REVISITED.

By ALBERT F. ROSA, M.D.

(Concluded from p. 267.)

When changing boats at Hammerfest I had an hour or two to spare and so had a look for larvae of *Aglaia* var. *polaris* at the spot where it occurred the year before, but it was not to be found. If eggs had been deposited they had not hatched, as no webs were to be seen. I got a web of small larvae when passing through Narvik—not, however, so likely to produce the variety

—and I also observed the larvae of *Pyrameis atlanta* at the same place.

Six wolves were shot near Abisko jaure, which is a lake in the National Park Reserve, by a Lapp the day before I arrived, undoubtedly attracted by the deer, amongst which they do much damage, and often with no other object than the pleasure of killing. I was told that the lynx—*Felis borealis*—is still occasionally met with, sometimes far south, and its inroads amongst the herds is a much more serious matter. While on the subject I might mention that the ermine was common on the shore of the träsk about the motor landing-stage.

I collected at Björkliden and Lapporten at first, and got *Pieris* var. *bryonie* in beautiful condition, fresh out and common; *Brenthis freija* still going well, many perfect: and *B.* var. *jingal*, among others approaching the type *euphrasyne*; also *B.* var. *ossianus*, *B.* var. *arsilache*, *B.* var. *hela*, and added *B.* var. *borealis* to my list. The last was absolutely fresh and common on July 1st, though it was not long in getting worn, as it flies in the thicker bushy spots, alighting on the wild flowers growing in the marsh.

Larvae of *Aglais* var. *polaris* were found at Björkliden behind a shanty where I found them in 1919. *Erebia ligea* was emerging. Some examples of the latter taken did not exhibit the normal rusty band and spots, there being a frequent tendency to these—the band and spots—being of a greyer shade, in one or two quite violet grey, which gives them a most remarkable appearance, the colour contrasting with the dark ground-colour.

Eueis norna here also, *Glaucopsyche* var. *cyparissus* mostly fresh and fairly common, and one large example of *Papilio machaon*, nearly 4 in. across. I also took *Colias palaeo* var. *lapponica* before I left, and *C. werlandi* was still on the wing, some being fairly good.

Leaving Abisko I went on to Bräcke, and stopping at a place called Järpen, in Jamtland, for one day, I found the following species: *E. embla*, *B. frigga*, *B. ino*, very small, and *Nomia des semiargus* as well as *P. icarus*, *E. ligea* and one *Melitaea* not yet determined, probably *parthenie*, Bkh. The day was dull, or much more could have been done.

The original list of desiderata was as follows:

PIERIDÆ.—*Pieris napi* var. *bryonie*, forma *scandinavica*, *Colias palaeo* var. *lapponica*, *C. nastus* var. *werlandi*, *C. hecla*.

NYMPHALIDÆ.—*Brenthis freija*, *B. frigga*, *B. thore* var. *borealis*, *B. aphirape* var. *ossianus*, *B. euphrasyne* var. *jingal*, *B. selene* var. *hela*, *B. chariclea*, *B. polaris*, *B. pales* var. *lapponica* et var. *isis*, *Aglais urticae* var. *polaris*, *Melitaea iduna*.

SATYRIDÆ.—*Erebia embla*, *E. disa*, *E. (medusa* var.) *polaris*, *E. lappona*, forma *Scandinavica*, et var. *vollux*, *E. ligea*, forma *Scandinavica*, *Eneis jutta*, *E. norna*, *E. bore*.

LYCENIDÆ.—*Chrysophanus hippothœ* var. *stieberi*, *C. phlæas* var. *hypophleas*, *C. amphidamus*, *Latiorina orbitulus* var. *aquilo*, *Glaucopsyche optilete* var. *cyparissus*, *Plebeius argus* (*argyrognomen*, var. *aegidion*).

HESPERIDÆ.—*Hesperia centaurœ*, *Augiaades comma* var. *catena*.

Of these thirty-one I have taken twenty-seven in the two seasons. As to the remaining four, *B. chariclea*, which is very rare, has apparently never been taken by any British entomologist. The last recorded capture was by Schöyen in 1879. *Latiorina orbitulus* var. *aquilo*, last record Schöyen 1879, also very rare.

I thought I had taken *B. polaris* near the Skadavaara, but the specimens (two) appear to be varieties of *freija*. Similarly with *E. bore*, I am afraid those taken must be referred to *E. norua*.

During the last season I have added to my list *B. frigga*, *E. disa*, *B. thore* var. *borealis* and *M. iduna*, the last never having been taken by a British collector. The locality (Alten) where it was taken appears to be a new one for the species. Herre Sparre Schneider gives only Sydvaranger. Schöyen took one example in the Porsanger Fjord in 1879. That it can be taken at Abisko I think has been substantiated, because I noted a ♀ specimen in the museum at Freseati which was marked "Abisko," and it appeared to be of recent date. I have also the word of Prof. Aurivillius that it does occur there; curiously enough, the Professor told me that he had never been to Abisko.

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THE MACRO-LEPIDOPTERA OF COUNTY TYRONE.

BY THOMAS GREER.

(Continued from p. 261.)

**Ennomos quercinaria*, Hufn.—Very local in woods at Lissan and near Killymoon.

**Ennomos alniaria*, L.—Not uncommon in birch woods at Lissan, Tallyhogue, and near Stewartstown.

Selenia bilunaria, Esp.—Generally common in the county; the var. *gullaria*, Haw., occurs: Prof. J. W. Harrison remarks that the local form is much more richly coloured than North of England specimens.

Selenia lunaria, Schiff.—Very local at Favour Royal (Kane); two examples at light at Lissan.

Gonodontis bidentata, Clerck.—Generally abundant, varying from a pale biscuit colour to brownish black.

Himera (Colotois) pennaria, L.—Locally abundant at Favour Royal and Ballygawley (Kane); also near Lissan, Killymoon;

and about Stewartstown several males have the transverse lines very dark and the wings suffused with black scales.

Crocallis elinguaria, L.—Common in woodlands.

Ourapteryx sambucaria, L.—Local and not abundant near Lissan, Tullyhogue, and at Stewartstown.

**Eurymene dolabraria*, L.—Very local at Lissan, Killymoon, and near Stewartstown; larvae beaten from hazel and beech.

Opisthograptis luteolata, L.—Abundant everywhere. Prof. J. W. Harrison writes of local examples "very fine and clearly marked, much different from ours" (*i. e.* in Northumberland and Durham).

Epione apiciaria, Schiff.—Locally abundant and widely distributed in the county; sometimes appears in swarms at Killycolpy Wood together with another local species, *Evergestis straminalis*.

**Semiothisa liturata*, Clerck.—Local in pine woods at Lissan and Tamnamore, Killycolpy Wood, Lough Neagh.

Hybernia rupicapraria, Hb.—Very abundant along hedgerows in January and February.

Hybernia aurantiaria, Esp.—Local, but not uncommon, in birch woods near Lissan and at Killymoon and at Stewartstown; Mr. Kane also met with it at Favour Royal.

Hybernia marginaria, Bork.—Abundant and widely distributed in the county; a dark purple-bordered form occurs locally.

Hybernia defoliaria, Clerck.—Common in woods, and very variable; two examples of var. *obscurata*, Staud., near Lissan.

Anisopteryx aescularia, Schiff.—Generally common in the county.

**Phigalia pedaria*, Fb.—Local but often abundant at light at Lissan and Tullylagan; a fine large pale form; larvae on sallow and sloe.

**Pachys (Amphidasys) strataria*, Hufn.—A single female at rest on a sallow trunk, Longhry; another bred from a larva beaten from wild cherry near Stewartstown, April, 1921.

**Pachys betularia*, L.—Common and widely spread in the district; larvae on sallow, birch and sloe.

Boarmia gemmaria, Brahm.—Several examples in gardens at Stewartstown.

Boarmia repandata, L.—Generally abundant; ab. *destrigata*, Haw., not uncommon; strongly-marked forms with pale lines and blotches at Lough Fea.

Cleora lichenaria, Hufn.—Local but not uncommon at Trillick (K.); not rare near Lissan, Killymoon, and at Stewartstown.

Tephrosia crepuscularia, Hb.—Common at Favour Royal and Altadiawan (K.); also at Tamnamore; rare near Lissan.

Ematurga atomaria, L.—Abundant on moorlands and bogs.

**Bupalus pinaria*, L.—Locally abundant in fir woods at

Lissan, Killymoon and Tamnamore; a dark form of the male occurs in the latter locality.

**Solidosema ericetaria*, Vill.—Local, but often not uncommon on the bogs at Lough Neagh, where a blackish streaked ab. *intermedia-fumosa*, Turner, and an almost black form, ab. *fumosa*, Mibi., occur.

Thamnonoma (Itame) wanari, L.—Not common at Favour Royal (K.); a few examples in gardens, Stewartstown.

**Lozogramma (Phasiane) petraria*, Hb.—Abundant locally among bracken at Killymoon and near Tamnamore.

Chiasmia (Strenia) clathrata, L.—Locally common in meadows and on railway-banks; ground-colour silvery white, rarely yellowish; ab. *radiata*, Haw., near Tamnamore.

Scodionia belgiaria, Hb.—Not very common, but widely distributed in the county on the moorlands and bogs at Altadiawan (K.), near Lough Fea, and at Lough Neagh.

**Perconia (Aspilates) strigillaria*, Hb.—Abundant on the bogs at Lough Neagh, varying from a pale form to one approaching ab. *grisearia*, Staud.; banded varieties are also sometimes not uncommon.

ZYGENIDÆ.

Zygæna lonicerae, Esp.—Locally abundant in damp meadows; several specimens with the middle pair of spots confluent; one example with posterior wings partly orange; the larvae only found on the meadow vetch, *Lathyrus pratensis*, in this district.

Zygæna filipendulae, L.—Local and not always abundant; two specimens bred and one captured with the anterior wings pale steel blue, the spots and posterior wings pink, and the fringes of the wings whitish. Hybrids between this species and *loniceræ* occur in one or two localities: these have the borders of the posterior wings broad and undulating internally, and the sixth spot of anteriors very small: one example of this form has only four spots on the left wing, the lower spots of the outer and middle pair being entirely wanting.

**Ino (Adscita) statices*, L.—Not very common in damp meadows near Tamnamore and at Lough Neagh.

SESIDÆ.

Trochilium crabroniformis, Lewin.—Larvae abundant, infesting sallow, poplar and osiers, and even dwarf sallow on the moorlands at 900 ft.; a very small male bred from a larva found feeding in the "decayed" wood of a dead poplar tree.

HEPIALIDÆ.

Hepialus humuli, L.—Abundant in meadows; and in stormy weather often flying in little groups on the sheltered side of trees and tall hedges.

Hepialus velleda, Hb.—Some seasons very abundant and in others scarce; var. *gallicus*, Ld., almost as common as the typical form.

**Hepialus lupulina*, L.—Local but not uncommon at Killycolpy Wood on Lough Neagh and near Tullyhogue.

Hepialus hecta, L.—Abundant locally in damp woods in the district, and also near Favour Royal (K.) ; common in several localities where bracken is absent, the larvae no doubt feeding in the roots of the male fern *Lastrea Filix-mas* or perhaps in a species of *Carex*.

SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

BY F. C. WOODFORDE, B.A., F.E.S.

(Continued from p. 163.)

GEOMETRIDÆ.

THIS group has been arranged according to Mr. L. B. Prout's system worked out in Seitz's 'Macrolepidoptera of the World—Palæarctic Geometridæ.'

The group is well represented, there being very long series of most of the variable species, and no species is entirely unrepresented.

Before going further I should like, on behalf of the Hope Department, to tender thanks to those collectors who have so kindly added to the collection since these notes were first published, and especially to Mr. Greer, of Stewarts Town, who has presented a most interesting lot of Irish insects, and the Rev. C. Ash, of Saxton Vicarage, who has done the same with Yorkshire insects, so filling up several gaps in localities which were before unrepresented. Several others have also added contributions. Even the commonest species from unrepresented localities are most welcome.

ÆNOTHERINÆ.

Aplastis ononaria.—A single specimen without data from the Spilsbury Collection.

HEMITHEINÆ.

The sub-family is well represented.

Two remarkable male specimens of *Hipparchus (Geometra) papilionaria* bred by Prof. Poulton have a very blue tint, and stand out very conspicuously in the series. They were bred from larvae reared by him for experimental purposes (see 'Tr. Ent. Soc.', 1888, pp. 592-5, and 1892, pp. 310-11).

ACIDALIINE.

Acidalia immorata.—A long series with full data.

A. rubriginata.—Series of 26, 9 with data.

A. floridactata (remutata).—A remarkable specimen from the Meldola Collection, labelled "Forres, May 20, 1913," has a grey ground-colour with a fairly distinct grey central fascia.

A. nigropunctata (strigillaria).—Twenty in all, 5 with data, from the Pogson-Smith Collection, one labelled "Folkestone, 16.7.98," three others "Folkestone, 23.7.00," and the fifth, "Folkestone, 28.7.00."

Ptychopoda (Acidalia) ochrata.—Series of 19, 9 of them from the Meldola Collection, labelled "Deal."

P. serpentata (perochraria).—One specimen without data from the Spilsbury Collection.

Ptychopoda (Acidalia) eburnata (Contiguaria).—A series of 21 with data, mostly from Penmaenmawr.

P. straminata.—Series of 17 from the New Forest taken by myself; 6 from the Champion Collection from Woking; 5 *circellata* without data from the Spilsbury and Sellon Collections.

P. herbariata.—Two from the Spilsbury Collection without data.

P. holosericata.—A long series with full data.

P. osseata (humiliata).—Series of 13 with full data.

P. degeneraria.—Series of 26 with full data.

Cosymbia (Ephyra) pendularia.—A long series of the type. A series of 80 from N. Staffs. ranging from pale almost typical specimens up to the darkest form of var. *subroseata*. Two bred from N. Staffs. var. *subochreata*, Wdtd., one being the original type (see 'E.M.M.' 1910, p. 114). One specimen (the type) of var. *orbiculoides*, Wdfde. (see 'E.M.M.' 1919, p. 103). One specimen var. *decorata*, Newman (= var. *nigrosubroseata*, Bowman), from Oxshot.

C. orbicularia.—Series of over 30, mostly bred specimens from the New Forest.

C. annulata.—Three var. *obsoleta*, Riding; 2 var. *bi-obsoleta*, Riding, from the Meldola Collection.

LARENTHINE.

Rhodometra (Sterrhia) sacraaria.—Two specimens from the Spilsbury Collection without data.

Lithostege griseata.—Series of 24, 13 with data.

Oporumia (Oporobia) christyi.—Three specimens from the Meldola Collection labelled "O. Christyi, Ireland, bred 1910."

Eustroma (Cidaria) reticulata.—Series of 16. Fourteen with full data. Six of the specimens were presented to the collection by the Rev. E. J. Nurse, and 2 by Mr. F. Littlewood. A larva,

pupa, and a dried portion of the food-plant, *Impatiens noli-metangeria*, were also presented by Mr. Nurse.

Plemyria (Melanthia) bicolorata.—A fine series of Scotch forms from the Meldola Collection includes many var. *plumicollata* and intermediate forms.

Cidaria (Thera) variata.—A fine series of about 40, bred and taken wild by myself and the late Major Robertson in Hampshire, clearly shows the distinctness of this species from *obliquata*. Of this latter species there is a very long series from many parts of Great Britain.

Cidaria truncata.—A very long series of English and Scotch forms. From the Hope Collection are three of Haworth's specimens of var. *comma-notata*. One of them, labelled with his characteristic MS., is probably his original type.

C. concinnata.—Seven specimens from the Meldola Collection are labelled "I. of Arran." Five more from the same collection are labelled "Tarbert, Aug 1914." These do not show so much rufous coloration as the Arran specimens.

C. immanata.—A long and beautiful series from England and Scotland. A Haworth specimen of var. *marmorata* from the Hope Collection, and so labelled in the characteristic MS., is probably his original type.

A specimen without data from the Spilsbury Collection of var. *thingvallata*.

Xanthorhoe fluctuata.—A long series with many interesting aberrations. A specimen from the Meldola Collection is labelled "Dunbar, Aug. 12, 1912."

It is a most remarkable specimen, and at first sight it is difficult to believe that it belongs to this species, but on the whole the markings agree, and Mr. Prout has seen and confirmed it. The base of the fore wing is pale grey, bounded outwardly by a thickish black line corresponding to the outer part of the normal dark basal blotch. This is followed by a pale grey band intersected by three white streaks corresponding with or parallel to the veins. Beyond this rather narrow band comes the unusually broad central fascia of darker grey, rather wider than normal, and extending entirely across the wing, bordered on each side by a black line, which becomes less distinct towards the inner margin. Some of the veins in the fascia are white. The discal spot is distinct in the usual place. A distinct white line borders the outer black line, and both are much less indented than in a normal form. Touching the white line at the costa is a dark blotch extending to the apex of the wing, but partially broken by the whitish subterminal line. The outer part of the wing is grey except for the subterminal line. The fringes are spotted. The hind wings are pale grey, and have only two darker lines parallel to and near to the outer edges of the wings. The fringes

are spotted. The general aspect of the specimen is much smoother and much less mottled than normal.

Xanthorrhoe (Melanippe) montanata.—A specimen of var. *costorata* without data from the Spilsbury Collection.

X. (Coremia) quadrijasciaria.—A fine series of 22 from the Oxford district, of which 18 were bred and presented by Mr. C. Rippon. There are also 6 Surrey specimens from the Champion Collection, and 2 from Essex from the Meldola Collection.

Cidaria obstipata (flavriata).—Series of 36. Fifteen ♂, 21 ♀. Twenty-six with full data; 10 bred, from Paignton; 16 bred, from Bournemouth.

C. sagittata.—Series of 25. Eleven with full data.

Euphyia (Anticlea) encyclata.—Series of 40. Twenty-eight with full data; of these, 6 are labelled "Perth, bred from pupa, W. H. Horwood." Sixteen were bred by myself from a wild female taken by me at Paignton, August 1st, 1919. The female parent is also in the series.

Euphyia (Melanippe) unaugnata.—Series of 30, 19 with full data, mostly from Surrey and Hants.

E. picata.—Series of 25, 12 with data from Hants and Surrey.

E. (Phibalopteryx) polygrammata.—Series of 11. One labelled "Cambridge, 1878," from the collection of the late Major Robertson. Eight from the Spilsbury and 2 from the Chitty Collections, without data.

Epirrhoe (Melanippe) sociata.—A very long series. One remarkable aberration taken by myself in June, 1920, on Cannock Chase is fully described, 'Entom.', vol. liii, p. 286.

Perizoma (Emmelesia) taeniata.—Nine specimens. Two with data. One from the collection of the late Major Robertson is labelled "Lynton, July 31, 1901." The other was taken by myself at Paignton, August 1st, 1919 ('Entom.', 1919, p. 21).

Perizoma (Emmelesia) affinitata.—A remarkable specimen from the Sellon Collection labelled "Salway Collection" has an ochreous ground-colour instead of the normal dark brown. One specimen of ab. *turbaria*, St., from the Meldola Collection from Kent, Darent Wood.

Hyliomena farcata (clavata).—A long and very varied series from many English and Scotch localities.

Emathecia pini (togata).—Series of 38. Twenty-three with data, all Scotch.

E. irregnata.—The series of 26 includes 13 with full data, all from Hampshire.

E. insignata.—A bred series of 10, labelled "Leominster, Mrs. Hutchinson." Four without data from the Spilsbury Collection.

E. palustraria (pygmaea).—Series of 11. Nine without data.

from the Spilsbury Collection, 2 labelled "Aberdeen, 1916," presented to the Collection by Mr. A. Horne.

E. venosata.—A long series, including 11 from Shetland with data.

E. trisignaria.—Series of 18, of which 4 from the Sellon Collection are labelled "Bred Burton, June, 1882."

E. helveticaria.—Twenty-one in series, including 12 from the Meldola Collection from Perth, with full data.

E. satyrata.—Series of 46. Thirty-six with data, including 12 var. *callunaria* and 8 var. *curzonii*.

E. tripunctaria (albipunctata).—Forty-three with full data and 8 without data, these last being from the Hope and Spilsbury Collections. In a series from Shropshire, bred by myself, is one specimen of var. *angelicata* entirely black, and another specimen very closely approaching, but with the white spot at the anal angle of the fore wing faintly indicated.

E. denotata (campanulata).—Series of 25 with full data from Worcester, Somerset and Sussex.

E. jasioneata.—Series of 19 with full data, 9 of them from Cornwall. The remaining 10 are interesting, being bred by Mr. B. G. Adams and myself from larvæ taken feeding on the flowers of Canterbury Bells in his garden in Mid-Devon far from the sea in 1915 and 1917.

E. distinctaria (constrictata).—A series of 21 with full data—17 from Cornwall, 2 from Gloucester, 1 from Portland, 1 from Sligo.

E. extensaria.—Series of 16 with full data.

E. fraxinata and *E. innotata*.—Series of 19, 10 with full data.

E. virgureata.—Very poorly represented by a series of 6 from the Spilsbury Collection, without data. There were no specimens in any of the later collections.

E. debiliata.—A long series with full data from North Staffordshire, and 1 specimen from the Champion Collection from Surrey.

The genus *Eupithecia* is well represented on the whole, no species being without an example, and there are long series of most of the less rare species.

Cænocalpe (Phibalapteryx) lapidata.—Series of 21 with full data. Four from Sutherland from the Pogson Smith Collection, and 17 from Lanark from the late Major Robertson's Collection.

NOTES AND OBSERVATIONS.

AGLAIS URTICÆ, AB. AND *CIDARIA IMMANATA*, AB.—The following two varieties were captured by me at Gathurst near Wigan in July of this year, and seem worthy of being recorded. *Aglais urticæ*, an aberration, captured on the 11th, differs from a normal specimen as

follows—Upperside: Fore wing—red ground-colour deeper than usual, black terminal border very broad. Blue lunules almost obsolete, only represented by three diffuse patches of blue scales in centre of border. Yellow spots along costa absent, first from base being red, and second strongly suffused with black. White spot near apex less well defined and larger than usual and slightly suffused with black. Hind wing—usual yellow and red band from anal angle to costa represented by a deeper red oval patch traversed by black veins and not reaching vein 6. Underside fore wing—terminal border of dark striae much broader than usual, usual grey-blue lunules absent. Hind wing—basal half black, outer half dark fuscous. Grey-blue lunules in terminal band present but smaller than usual, and not joined together. It was very distinct even in flight. *Cidaria immanata*, a form seen on 15th and captured on 18th is as follows: Ground-colour white. Central band and basal patch black. Usual dark markings beyond central band reduced in size. Hind wings normal. It seems to be referable to ab. *thingrallata*, Staud. It has a strong superficial resemblance to the black-banded form of *Lampropteryx suffumata*.—G. H. E. HOPKINS; Shevington Vicarage, near Wigan.

Cœnonymphia pamphilus, var.—Whilst collecting near Padstow, N. Cornwall, in August, 1919, I took a variety of this insect similar to the second variety mentioned by Mr. Augustus E. Stafford ('Entom.', October, 1921, p. 242), namely with four dark spots along the outer area of the hind wing above. I have been unable to trace records of other similar varieties.—KENNETH J. HAYWARD, F.E.S.; Reservoir, Aswan, Egypt, October 14th, 1921.

Cœnonymphia pamphilus, vars.—With reference to the note on *C. pamphilus*, vars. (p. 212), by Mr. A. E. Stafford, I should like to reply to his question that on looking through my fairly long series of this butterfly from various localities, I fail to find *any* with "blind eye-spot at anal angle of hind wings," but several with "spots or points along the outer area." In those from Amasia and Broussa, in Asia Minor, only faintly indicated whereas in 2 ♀♀, one from Palerino, Sicily, and the other from Ain Zahalta, in the Lebanon, these spots are very distinct, and in the case of the latter, from Ain Zahalta, two on each wing are pupilled minutely with white.—M. E. FOUNTAIN, F.E.S.; 126, Lexham Gardens, London, W. 8.

Plebejus (Lycena) argus = *Egon*; SECOND BROOD.—On October 30th I took one newly emerged male specimen of the above species in the New Forest between Lyndhurst Road and Beaulieu Road. Prolonged search by myself and an entomological friend failed to yield further specimens. Tutt says ('Brit. Lepid.', vol. x, p. 227) "in Britain the species is entirely single-brooded," and gives no date of specimens captured later than September 19th in the year 1877 (*loc. cit.*, p. 230). The species was flying in the greatest profusion in the New Forest on June 25th of this year.—WM. FASSNIDGE; 47, Tennyson Road, Southampton.

NOTES ON *CYANIRIS ARGIOLOUS*.—With reference to the Rev. G. H. Raynor's note in the 'Entomologist' for September I have to-day, October 16th, seen in my garden a specimen of *Cyaniris argiolus*,

evidently a third brood. I may mention that the first brood of this species from April 12th until the middle of May was extremely scarce, only two or three being seen, whereas the July brood was abundant—a most unusual occurrence in my experience.—A. H. JONES; Eltham.

THIRD BROOD OF SELENIA TETRALUNARIA (ILLUSTRARIA).—Among a second brood of larvae of this species one individual fed up rapidly and pupated about August 15th, while none of the remainder were more than half grown. This produced a ♀ moth on September 11th, the specimen being rather smaller and considerably darker than the second-brood specimens.—T. M. BLACKMAN; 27, East View Terrace, Fulwood, Preston.

EUVANESSA ANTIOPA IN GLOUCESTERSHIRE.—On September 12th I took a fine specimen of *E. antiopa* in the Forest of Dean, in the Holly Wood near the Speech House. I have let the Bristol authorities see it, and they and all my friends have recommended me to write to you, as being the Editor of the 'Entomologist,' which I now do. I am a pupil at Clifton College.—IAN R. P. HESLOP; Thirlwell House, 34, Henleaze Gardens, Westbury-on-Trym, Bristol.

PYRAMEIS CARDUI AND P. ATALANTA IN EAST TYRONE.—Both these species have been remarkably abundant in this district during the past autumn, especially the latter. *P. cardui* was common during the month of September on scabious flowers, two males being captured with very dark hind wings. *P. atlanta* has occurred in hundreds at scabious and ivy bloom; several were observed in very fair condition on November 4th. Amongst a number of minor aberrations the following are worth recording: an example taken on October 24th with the marginal band on posterior wings shaded from pale red to yellow: another with the pale buff colour on underside of posteriors much increased, the usual costal spot being extended to the outer angle of the wing; several specimens with the spot in marginal border of hind wings (next to the blue clouding), also of a blue colour.—THOMAS GREER; Curglasson, Stewartstown, Co. Tyrone.

MANDUCA ATROPOS AT ABERDEEN.—A good specimen of *M. atropos* was captured here, at light, on October 7th last.—L. G. ESSON; 6, Esslemont Avenue, Aberdeen.

SPHINX CONVOLVULI IN SUFFOLK.—On Sunday, September 4th, 1921, Mr. Spencer Race of this town brought me a female of the above which he had just found sitting on the kerbstone (no lights near). I may add that I now have a fine series of this species, but strange to say I have never personally captured one of them. My first specimen was taken at the flowers of tobacco plant about 9.20 p.m., September 23rd, 1898, whilst myself and a friend were working for it; my friend was the lucky captor and gave the moth to me, as he already possessed several. Since then the remainder of my series have been made up by specimens brought to me by gardeners, etc.—HERBERT WM. BAKER; 26, Woodfield Terrace, Ipswich Road, Stowmarket, Suffolk.

DARK VARIETY OF ARCTIA CAIA, L.—A colleague kindly gave me in July a bred variety of the common tiger moth in which the white of the fore wings is completely suppressed, leaving them chocolate-brown suffused with black. The hind wings are black with the usual dark spots clearly visible when the light glances on them; the inner margin, however, is, as usual, orange-tawny. The head, thorax and body are fairly normal. Unfortunately the specimen had been allowed to flutter in a small box all the night, so that it is now decidedly rubbed.—GEO. B. WALSH; 41, Gladstone Street, Searborough.

DEIOPHEIA PULCHELLA IN ESSEX.—I thought it would interest readers of the 'Entomologist' to know that a female specimen of *Deiopheia pulchella* in good condition has been captured. It was caught during the afternoon of October 19th in a locality in this town not far from the sea coast.—M. WRIGHTSON; Kenmore, Eton Road, Clacton-on-Sea.

PARASEMIA PLANTAGINIS, VAR. HOSPITA.—I took a specimen of this variety on the Longridge Fells, near Preston, on June 30th, quite close to where I took one last season; a few typical ♂♂ were seen flying, but they were scarceer than usual. *Vanessa ic.*, *Gonepteryx rhamni*, *Lycena egeon*, *Cyaniris argiolus* and *Ayrotis lucerneae* were all very scarce at Witherslack this year, where usually they are all common, and *Aglais urticae* was by no means plentiful.—T. M. BLACKMAN; 27, East View Terrace, Fulwood, Preston.

MARGARODES UNIONALIS IN HANTS.—It may be of interest to record in the 'Entomologist' the capture of a perfect specimen of *Margarodes unionalis*, which I took in my garden here, at an Arbutus, on October 22nd last.—JOHN E. EASTWOOD; Wade Court, Havant.

COLIAS EDUSA, C. HYALE, ETC., ON THE SUSSEX COAST.—On the downs in the Shoreham and Worthing district the first brood of *Pararge megera* appeared on May 9th, the second brood on July 18th, and it was last seen on August 20th. On September 30th a third brood appeared and has continued on the wing up to October 17th. *Agriades corydon* was plentiful by July 25th, and had doubtless been out a week when first observed. After September 7th none were seen until September 30th, when a male and female in perfectly fresh condition were taken and two freshly emerged females on October 5th. On September 28th four *Colias edusa* were seen and one taken. On September 30th one *C. hyale* was seen and taken; October 5th ten *C. edusa* seen, two taken; October 8th, seven seen, four taken; October 11th, four seen, three taken. On October 13th one *C. hyale* was netted on a bare stubble, but while the box was being prepared for its reception it slipped out under the net. On October 17th, on a steeply sloping bank facing south, I saw during an hour about six *C. edusa* and about twelve *C. hyale* flying together. One *edusa* was taken, and, as I supposed at the time, three *hyale*, but on subsequent examination at home one proved to be a very fine example of *C. edusa*, var. *helice*. One of the *hyale* is a very small

male and does not exceed 38 mm. in expanse. The next day I again visited the same place, but although it was an equally sunny day there was a strong breeze from S.E. and everything appeared to have been blown off the ground. Owing to prolonged absence from England I have not seen *C. hyale* on the wing since 1868, when I took it plentifully in Kent, and I remember it was over by about September 10th. Considering the date of the present captures I assume they are not recent immigrants, but bred in the locality, and I now feel convinced that I saw a single *C. hyale* in the same neighbourhood about the end of July.—CHARLES M. WOODFORD: The Grinstead, Partridge Green, Sussex.

SECOND BROODS IN 1921.—I observed several *Nisoniades tages* out on July 31st, rather pale in colour. On September 24th I netted *Brenthis selene* at Oakhanger; on September 24th *Ebulia sambucalis* came into the room—presumably a second brood. Is this unusual? I feel sure *Agrotis puta* had three broods here this summer. It comes commonly to light here, and this year as usual two broods came, of which I did not preserve the dates. But on October 1st two fine females quite fresh fell from ivy-blossom in my garden. *Acidalia virgularia* haunts the S.W. wall of the house all summer and was still coming in at the window up to September 24th. Under artificial conditions *Diacrisia sanio* commenced to emerge on August 21st, full-sized specimens; some larvae died, but none showed any inclination to hibernate. I also raised a brood of *Nemophila plantaginis* from ova laid by a very pale ♀. They began to emerge on August 20th and some of the females are remarkably pale, the fore wings being cream with disconnected black spots, while the males are normal. They are undersized, however, and several larvæ ceased to feed. Since writing the above *Eupithecia albipunctata* has come to light (October 4th), *Porthesia similis* (October 6th), and *Cleora lichenaria*, a small specimen (October 8th). I once took an autumnal *P. similis* before, but I should think the others are rather unprecedented.—E. A. C. STOWELL; Eggars Grammar School, Alton, Hants.

PARARGE MEGÆRA TREBLE-BROODED.—In reference to the notes on *Pararge megæra* (*ante*, pp. 269–270) being treble-brooded, I may say that I saw near my home on the 16th ult. a perfectly fresh specimen of this butterfly. *P. megæra* is quite scarce enough in North Staffs at any time, but this record shows that there was very probably a third brood, and this as far north as any occurrences I have heard of.—THOMAS SMITH; Whiston Eaves, Froghall, Stoke-on-Trent, November 9th, 1921.

PARARGE MEGÆRA, ETC.—I thought it might be of interest to mention that a second generation of *Agrotis segetum* is nearly as common as the first in this district, and that the third broods of *Chrysophanus phœas* and *Pararge megæra* are quite frequent. *Calocampa retusta* seems to be not uncommon in the woods on this estate this autumn, where it is usually of very uncertain occurrence, if occurring at all.—R. GATTY; Ossemsley Manor, Christchurch, Hants, October 6th, 1921.

PARARGE MEGERA TREBLE-BROODED.—With reference to the Rev. Gilbert H. Raynor's note ('Entom.', 1921, pp. 269-270) on the appearance of a third brood of this species at Hazelleigh, in this county, and his remarks that he thinks a third emergence to be "quite unparalleled," I can assure him that it is not so, for I have frequently observed third broods both here and in North Devon, and believe, when the seasons are favourable, they may be always expected. This year, in this neighbourhood, the first examples of the first brood were noticed on April 27th, and by May 10th they were out in abundance. The second brood were well out by July 22nd, when a large number of bright examples were seen. On July 30th, and again on August 5th, females were observed egg-laying. They were becoming much worn by August 22nd, and worn specimens were to be seen every time I looked for them up to September 16th. On September 18th a very fresh ♂ was noticed, and this, I believe, was the first of the third brood. By September 26th fresh examples were plentiful, and I saw them every day I went out. On October 13th I counted three dozen flying about the railway bank between Dovercourt and Parkeston. The last examples, two in number, were seen October 17th. At Instow, North Devon, I have already recorded ('Entom.', vol. xlix, p. 287) that I saw one as late as November 13th, 1916. In 1917 I saw a number of fresh specimens on September 6th. In 1918, on August 11th, a large number were about, and on the morning of that day I must have seen at least a hundred flying by the roadside between Instow and Worlington House, a distance of about a mile. These might have been an early third, or a late second brood. Between October 13th and 23rd many more were seen, and these, of course, were a third brood. *P. eyeria* is also treble-brooded in favourable seasons, and I frequently saw them at Instow at the end of September and early in October from 1916 to 1918. It does not occur here. *C. pamphilus* is another species that is constantly treble-brooded—or, perhaps, it would be better to call it continuously-brooded, for there seems to be a succession of broods. *E. jurtina* I have often seen very late in the season when out shooting. In 1917 I saw one as late as September 24th, so it looks as if this species was occasionally double-brooded.—
GERVASE F. MATHEW, Paymaster-in-Chief R.N., F.L.S.; Dovercourt, November 15th, 1921.

SATYRUS MEGERA TREBLE-BROODED.—Regarding the Rev. Gilbert Raynor's note on the third brood of this species, he is in error by supposing those he observed to be quite unparalleled. It is usual for a third brood of *S. megera* to occur in the year during fine warm summers, the first appearing in April and May, the second in June and July, the third in September and October. In the unusually fine and hot summer of 1893 a third emergence occurred towards the end of September and October. In 1911, another fine, warm summer, I met with a large number of freshly emerged specimens on the wing in Norfolk on October 18th. During September and October of this year examples of the third brood of this species were common in most districts I visited in S.E. Essex. In 1893 I bred a third brood of this butterfly from ova deposited on August 2nd; the

imagines emerged from September 24th to October 5th inclusive, but one remained as a pupa throughout the winter and produced a fine male specimen on April 26th, 1904.—F. W. FROhawk: November, 1921.

WHAT IS *ZYGENA AB. HIPPOCREPIDIS*?—Can any reader inform me what is considered the true status of the aberration called *Zygæna ab. hippocrepidis*. My experience this season leaves me absolutely at sea. South, in his 'Moths of the British Isles,' is of opinion that it is a hybrid between *Z. filipendulae* and *trifolii*. Now in this area I came across a large colony flying during the last week of May through June. I found all were typical *hippocrepidis* with wider marginal borders to hind wings, the sixth spot divided by nervule. I secured a long series and examined some two hundred others, and did not in a single instance find any with five spots only, though two had the sixth spot very small. The point is as the season advanced I found that many were absolutely type *filipendulae*, exactly similar to others taken miles away in August. Again, among my *filipendulae* taken over a series of years on our chalk down I find a few ab. *hippocrepidis*. Now if a hybrid, one would expect to find a colony, large or small, of both *filipendulae* and *trifolii* near, but the nearest colony of *filipendulae* is at least five miles away and no *trifolii* near at all. I have never seen a specimen of *trifolii* taken within, say, ten miles. How can we account for cross-pairing? I have in the past often seen what I considered *Z. filipendulae* on the same ground but did not recognise it as ab. *hippocrepidis*, but this year, seeing it in such numbers, and at so early a date as the end of May, I examined them carefully and compared with type-specimens in my cabinet. It seems to me to be an aberration; but type is never found on the ground in August, and how account for the preponderance of the ab. in May and June. Again, if a hybrid, some few at least would take after the five-spotted parent. I would be very grateful if any reader having more experience than mine would write and give me information on this point, either through the 'Entomologist' or otherwise.—R. H. RATTRAY (Colonel); 68, Dry Hill Park Road, Tonbridge, Kent.

BUTTERFLIES ON THE SOUTH SALISBURY DOWNS, 1921.—The following notes on Rhopalocera, chiefly collected near the village of Damerham in South Wiltshire, may be of interest. *Gonepteryx rhamni*, *Vanessa io* and *Aglais urticae* were first seen on March 25th. *Pieris rapæ* first made an appearance on April 4th, and my first record for *Euchloë cardamines* was April 20th. During the hot summer all three species of *Pieris* were unusually abundant, and several diminutive specimens of *P. rapæ* were taken. *Argynnis aglaiæ* is usually fairly common, but this season only a single specimen was taken. I saw nothing of *Argynnis cydippe*, which was very plentiful here in 1919. Prior to 1919 I had not seen *Dryas paphia* on the downs, but this year it was fairly common everywhere. No specimens of var. *valesina* were seen. *Eugonia polychloros* is never common here, but I took a single specimen at Cripplestyle in July. *Pyrameis cardui* was more in evidence than usual, but *P. atalanta* was not seen at all. *Vanessa io* was much commoner than *Aglais urticae*: usually the

reverse is the case. *Pararge megæra*, *Epinephele jurtina*, *E. tithonus* and *Cornynympha pamphilus* were all very common. *Hipparchia semele*, a very common insect in 1909-11, almost disappeared about 1914-15, but was about again in fair numbers. *Aphantopus hyperanthus*, another insect whose numbers were declining, was by no means uncommon this year. Nothing was seen of *Pararge egeria*, var. *egerides*, although it generally occurs in small numbers. *Zephyrus quercus*, formerly confined to one or two oak woods, appears to have extended its range. *Chrysophanus phœas*, *Polyommatus icarus*, *Agriades corydon* were all common, and females of the last species seemed to be more in evidence than usual. *Plebeius agon*, *Aricia medon*, *Cupido minimus* and *Celastrina argiolus* were all much as usual. Of the Hesperiidae, it is interesting to note that a partial second brood of *Nisoniades tages* occurred in early August. *Augiades comma* was unusually abundant in July. In April I found a larva of *Gastropacha quercifolia* which developed more than the customary number of white marks. In this case the food-plant used was apple. I took a specimen of *Charaxes graminis* on August 4th—the first specimen I have seen in this locality.—A. STEVEN CORBET : 21, Sidmouth Street, Reading.

NOTES ON LYCAENIDÆ IN 1921 IN NORTH KENT.—The last year having been so abnormal, the butterflies were equally so in many respects. Everything was very early, in most cases very numerous, and in some varied much more so than in other years. This being within easy distance of the chalk downs, limestone (Kentish rag) and the clay weald along the river bed I had great opportunities, and devoted practically the whole season to the *Lycaenidæ*. I, of course, noted nothing new, but can confirm the conclusions come to by many others of the effect of a very hot, dry season. Some species generally present in more or less numbers were absolutely absent. *Chrysophanus phœas*, L., was very abundant, and ran to three large broods. First brood: I saw the first, a male, on May 9th; they were numerous, but not in any way varied. By the 27th of the month they were faded and much worn. On June 15th the second brood began to show up, and onwards in increasing numbers: they simply swarmed everywhere. I at once noticed that the suffused forms were in large numbers; in one field on the outskirts of the town they were in excess of normal coloured. I secured a fine series of a form very dark, fore wing with very little copper showing, and the copper band on hind wing reduced to a mere thin line. Many had quite long tails, both in the suffused forms and normal type, with intermediates of all lengths. Ab. *cœruleo-puncta* was very common, quite 30 per cent. showing spots, and in most cases three to four spots and very large and bright. The third brood was first seen on August 30th; I have never seen the species so common—they were everywhere. This brood was most varied, and showed a great tendency to light-coloured vars. I took in one small corner, where I usually get one-light brass-coloured in the year, at least eight, some with other variation combined. On September 12th I caught a perfect male, with right side normal, left side both wings ab. *schmidtii*, a very pale clear straw colour, fringes on left side very pale. The following abs. were very much in evidence—*cœruleo-puncta*, *subradiata* and

intermedia. I also secured a pair of ab. *cupro-puncta*. The colour of the normal types was very bright and deep copper. *Callophrys rubi*, L., was more than common, the first seen on April 30th quite freshly emerged. From this date on through May they were everywhere, and it was quite a common occurrence to catch three or four in one stroke of the net. I secured a nice series of undersides, ranging from fully spotted on all wings to two ab. *caerulea*, and one specimen with ground-colour a dull brown green. Many had a few light brown scales towards anal angle of hind wings, and some few a thin obsolete line, orange colour, just inside the anal angle. *Zephyrus quercus*, L., was absolutely absent. I searched some well-known haunts, but did not see a single specimen. *Celastria argiolus*, L., was very scarce. They are generally common in all the gardens here, but I only saw one male of first brood and about six, including one female, in second brood. *Cupido minimus*, Fuess., was well out on the chalk at the end of May. I secured a good series on May 30th and June 2nd. They were very well sealed with blue. Unfortunately owing to distance I was unable to visit the ground during July or August, so cannot say whether there was a second brood or not, but owing to the heat all the food-plant was absolutely burnt up. *Plebeius aegon*, Schiff: both the chalk form, var. *cretaceus*, and the heather form are found near here. I could only have one day on the chalk downs, where var. *cretaceus* was out in great abundance, with many nice blue-marked females. I took a few of the beautiful form with well-marked orange-red lunules on all wings and blue wedges running up to the centre of hind wings. I also secured a few females without blue sealing, but a white line along the outer margin of hind wing between the spots and edge. The heather form was actually obtained just outside Kent area in Sussex. I saw the first, a male, on June 17th and caught eight. Between that date and the 23rd of the month they were very numerous and I secured a nice series, including one very blue female and one female of normal colour, but half of each wing light grey, the line sharply defined and quite symmetrical on both sides, the markings on undersides of wings showing clearly through the thin sealing. The fly was very early everywhere and absolutely normal in intensity of colouring. *Agriades bellargus*, Rott., was very early on the wing; I unfortunately missed the first brood, and only saw a few rags when I did visit their haunts. I kept a good look-out for second brood early and saw first a few males on August 4th. No females appeared till the 9th. The females of this brood were absolutely without any trace of blue sealing on any wings: they were all of a very dark blackish brown, with well-marked orange eyes on all wings. The eyes did not have any blue, but greyish-white markings near them. They in every way conformed with the type mentioned by Tutt as the normal form in hot, dry years. I last visited the ground on August 18th; they were then out in swarms, but practically all confined to a small corner in one field. *Agriades corydon*, Poda., was, like the rest, very early. Owing to an accident I was unable to visit the ground till July 18th; I then found them well out, many males showing wear, females few. They continued common till August 18th, but were absolute rags by that date. I found a good range of variation,

ab. punctata with well-marked eye-spots quite common, also a nice *ab. marginata* and another *subsuffusa*. Many of the males were of the pale sky-blue colour as against the silver blue of normal years. The females, as in *A. bellargus*, were with very little blue scaling: I only saw two with any amount of blue out of perhaps 100 examined. I found the colour a dark brown, not so dark as *A. bellargus*, and the normal blue scale replaced with light grey. This, again, I take it, is typical of the very hot season. Among the females *ab. parisiensis* was quite common, with well-marked deep black arch joining the two spots. *Polyommatus icarus*, Rott., was another species that showed a great difference in first and second broods; there was also a well-developed third brood in September. The first noticed was a male on May 23rd. From the 24th onwards they were in swarms everywhere. The females were of a particularly dark bright blue and well scaled. The blue females preponderated to a large extent; I only took two all-brown females and three or four with a few blue scales only. *Ab. melanotora* was common and well marked, but only in females; among the males were many underside *ab. flavescentia*, the yellow being particularly pale coloured, in one almost white. The second brood was well out on July 14th and continued till the end of the month, when they were worn. The chief thing noted about this brood was the almost total absence of blue females. Out of more than 100 examined only two were well scaled and some twelve with blue scales at all. All were very dark fuscous brown with well-marked orange lunules on upper-sides. In males *ab. candiope* and *icarus* were in about equal numbers. Another point was that in first brood, the underside in males was normal light coloured, in second was much darker, and in many cases the hind wings were a deep yellow-brown: I also took two male *ab. melanotora*. Female *abs.* were much as in last brood; I took two very fine dwarf *ab. minor* with well-marked *melanotora*. The difference in size between two broods was not of a marked character. The third brood appeared on August 30th, and was, though not so numerous as the other two, well marked. Both males and females of this brood were very small as compared to the others, nor out of some thirty females examined did I see a single all-brown specimen and two very deep all-blue females; all the rest were with blue scales well shown. Of the undersides nothing of note and no especial variation. *Aricia medon*, Esp., was not common in either brood; and the only point of notice was that the second brood was very small. I took one male of first brood with orange-red marks on upper side replaced by pale lemon spots. It has been a most interesting season, and in my opinion the most prominent is the dark colouring of females of all double-brooded species and absence of blue colouring in these and in *A. corydon*, thus showing the effect of a very hot, dry summer on colour. — R. H. RATTRAY (Colonel): 68, Dry Hill Park Road, Tonbridge, Kent.

DEIOPEIA PULCHELLA IN SUSSEX.—I have to report the capture of a Crimson Speckled Footman Moth (*Deiopeia pulchella*) on Beachy Head, on October 7th. It appears to be a female.—GERALD HUGH BROWN: The Swingle, Brenchley, Kent.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—*October 19th, 1921.*—The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc., President, in the Chair.—The presentation by Mr. H. Donisthorpe of a drawing of Mr. T. W. Bates to the Society was announced, and a special vote of thanks was passed to the donor.—The following were elected Fellows of the Society: Messrs. H. J. Wilson, O.B.E., M.A., F.Z.S., 139, Bishop's Mansions, S.W. 3; Alexander John Nicholson, University of Sydney, New South Wales; F. N. Chasen, M.B.O.U., Assistant Curator, Raffles Museum, Singapore; Baron J. Bouck, Springhill, South Godstone, Surrey; and Percy A. Glick, 903, West Illinois, Urbana.—Mr. G. Talbot exhibited, on behalf of Mr. J. J. Joicey, new and rare Lepidoptera collected by Mr. Pratt in the Weyland Mountains, New Guinea, and also read a letter describing the country from which the specimens came.—M. F. Le Cerf, on behalf of Mr. J. J. Joicey, exhibited several new forms of African *Papilio*; comments were made on this exhibit by the President and Prof. Poulton.—Mr. W. G. Sheldon exhibited a series of 1300 specimens of *Peronea cristana*, including examples of all the 72 named forms; also a series of about 250 specimens of *Oxigrapha literana*.—Prof. Poulton exhibited examples of a form of *Heodes phleas* from S.W. Uganda, and discussed its relations with *H. abbotti*. He read some details of the genitalia of these forms supplied by Dr. Chapman. He proposed to treat *abbotti* as a race of *phleas*, and suggested the name “*ethiopica*” for the new race from Uganda.—Mr. Donisthorpe exhibited examples of *Gymnetron squamicolle* from Ireland; the pupa and larval skin of *Cassida nebulosa* taken on *Chenopodium album*; and larvae, both dead and living, of *Trionodes hirtus*.—Mr. W. J. Atkinson exhibited examples of *Ips erosus* found breeding in the Forest of Dean, and read some notes on this bark beetle and on allied species.—The following paper was read: “New or Little Known Exotic Tipulidae (Diptera),” by Prof. Alexander.—Mr. A. T. J. Janse gave a further account on methods of collecting when travelling in South Africa, illustrated with lantern slides.

November 2nd, 1921.—The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc., President, in the Chair.—The presentation by the President of a rare copy of Scopoli's ‘*Delicea Flora et Fornicæ*’ was announced, and a vote of thanks to him was carried with acclamation.—The following were elected Fellows of the Society: Messrs. Norman E. Miller, Dar-es-Salaam, East Africa; Oliver Richardson Goodman, 210, Goswell Rd., E.C. 1; K. P. U. U. Nair, M.A., Training College, Trivandrum; Frank Balfour-Browne, M.A., F.R.S.E., F.Z.S., Oaklands, Fenstanton, St. Ives, Hunts; E. Melville du Porte, M.Sc., Ph.D., MacDonald College, Quebec, Canada; Oliver C. Cassels, D.F.C., N.D.A., West Hill, Ottery St. Mary, Devon; O. C. Ollenhach, Survey of India Dept., Dehra Dun, India; J. B. Corporaal, Pieter Bothstraat, 39, The Hague, Holland; Douglas Cator, 13, Westminster Mansions, Great Smith Street, S.W.; Marco Pallis, Tatoi, Aigburth Drive, Liverpool; and Samuel Walker, 53, Micklegate Hill, York.—Mr. W. G. Sheldon exhibited a series of *Epinephele ianira* from Sutherlandshire showing an approach to var. *hispulla*; also *Pieris*

napi showing an approach to var. *bryoniae*.—Mr. Bethune-Baker a series of *Zygæna filipendulae chrysanthemi* from Birmingham.—Mr. F. W. Edwards a remarkable new insect from Kashmir, which, though probably representing a new family of Diptera, shows curious resemblances to the Mayflies.—Mr. L. Newman a gynandromorphous example of *Amphidasys betularia doubledayaria*, and an Ichneumonid parasite from *Sphinx ligustri*.—Prof. E. B. Poulton, F.R.S., the warble fly of the reindeer captured with its model *Bombus lapponicus anurnanicus*; he also read a note regarding observations made by Mr. Arthur Loveridge on the oviposition of the Mylabrid beetle *M. oculata*, Thunb., var. *tricolor*, Gerst.—Canon St Aubyn Rogers, butterflies from East Africa, including remarkable females of *Papilio dardanus*: examples of *Papilio rex* and *Mimacraea marshalli dohertyi*.—W. A. Lambourne, an oriental Danaine butterfly brushing the brands on its hind wings.—Mr. G. Talbot, on behalf of Mr. J. J. Joicey, new and rare butterflies from New Guinea and Peru.—Mr. H. Donisthorpe, a rare British Aphid, *Stomaphis quercus*, L.—Mr. A. T. J. Janse concluded his account on methods of collecting while travelling in South Africa, illustrated with lantern-slides.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—October 13th, 1921.—The President in the Chair.—Mr. A. W. Vesterling, 107, Castle Street, Battersea, was elected a member.—Mr. Soar lectured on "The Hydracarina or Water-mites," and showing a large number of lantern-slides and coloured drawings of species and structural details.—Mr. Grosvenor, the chief palaeartic species of the genus *Zygæna*.—Mr. Bleukarn, the scarce weevil, *Epipolæus caliginosus*, from Dover.—Mr. Newman, *Rumicia phleas* with ab. *obsoleta*, ab. *suffusa*, a golden form, and ab. *parripuncta*. He reports *Euvanessa antiope* seen by his son at Bexley.—Messrs. O. R. and A. de B. Goodman exhibited *Nordmannia ilicis*, var. *cerri*, and var. *aesculi*, with *Klugia spini*, having (1) straight white line below, (2) concave ditto, (3) and greatly widened ditto, all but the last two from Digne.

October 27th, 1921.—The President in the Chair.—Mr. J. A. Vernon, "Lynnouth," Reigate, Surrey, was elected a member.—Mr. H. Main exhibited a female *Scorpio europa* with her family from Hyères and gave notes on the life-history.—Mr. Grosvenor had seen a N. Indian species carry its young similarly.—Mr. A. A. W. Buckstone, several local series of *Ematurga atomaria* from southern areas with var. *unicolorata* from Burnley, including a very dark form from Horsley and some pale yellow forms from Otford.—Mr. Barnett, larvae of *Aretia villica* from Reigate and a varied series of Surrey *Rumicia phleas*.—Capt. Crocker, long series of *Malacosoma neustria*, bred from two pairings from Otford, (1) all light with narrow band, (2) mixed light and dark forms. He also showed a very long series, including ab. *alba*, ab. *ignita*, ab. *intermedia*, ab. *obliterata*, ab. *circulo-punctata*, ab. *radiata*, ab. *turcica*, ab. *suffusa*, and others with unnamed and intermediate forms.—Mr. O. R. Goodman, ab. *unimaria* of *Melitaea athalia* from St. Martin Vésubie.—Mr. Dennis, photographs of the English *Cimer lectularius* and the tropical *C. rotundatus* which had conspicuous sculpturing.—Mr. Turner read extracts of letters from Mr. G. B. Pearson in California, and showed

a specimen of *Echinocastus wisliczeni* from the Californian desert sent by him.

November 10th, 1921.—The President in the Chair.—Rev. R. E. E. Frampton, M.A., Halstead Rectory, Kent, and Dr. H. D. Smart, Shelly, Huddersfield, were elected members.—Mr. Laurence Chubb, of the Commons Preservation Society, gave a lecture with lantern-slides.—*Hv. J. TURNER, Hon. Editor of Proceedings.*

LONDON NATURAL HISTORY SOCIETY.—Lepidoptera Section: *October 18th, 1921.*—Dr. Cockayne in the Chair.—Second broods of *Thera variata* form *obeliscata* and *Porthesia similis* were reported by Mr. Bell.—*Rumicia phleas* were exhibited by Mr. Riches, who had bred them out the previous month, and by Mr. H. B. Williams, who also showed a specimen of *Epinephele janira* with a whitish right fore-wing, and varieties of *Melitea athalia*, *M. cinxia*, and *Abraxas grossulariata*.—Dr. Cockayne exhibited larvae of *Epinephele tithonus*.—Paper read, “Notes on British Skippers,” by Mr. H. B. Williams.

November 1st, 1921.—Dr. Cockayne in the Chair.—Mr. C. H. Williams showed a series with considerable variation in *Rumicia phleas*.—Dr. Cockayne exhibited *Sesia scoliaformis*, and Mr. Worsley-Wood a good selection of *Brephos parthenias* bred from larvae or taken in Surrey this year.—Paper read, “Distribution of *S. scoliaformis*,” by Dr. Cockayne.—Plant Gall Section: Mr. L. B. Hall in the Chair.—Among the exhibits were galls caused by *Eriophyes atrichus* on *Stellaria graminea*, *E. euaspis* on *Lotus corniculatus*, *E. ilicis* on *Quercus ilex*, *E. macrotrichus* on *Carpinus betulus*, *E. pteridis* on *Pteris aquilina*, *E. tiliae* var. *exilis* on *Tilia grandifolia*, *Perrisia bryonice* on *Bryonia dioica*, *P. carpini* on *Carpinus betulus*, *P. silvicola* on *Stellaria holostea*, *P. tubicola* on *Cytisus scoparius*, *Pemphigus filaginis* on *Gnaphalium uliginosum*, sawflies and Cecidomyiidae on various species of *Salix*, and *Beta maritima* swollen by larva of a micro-lepidopteron.—Mr. Hall recorded *Agropyron pungens* galled by *Isosoma graminicola*, a new host plant, found near Tilbury.—Paper read, “Notes on the Galls on Rosaceæ,” illustrated by specimens.—*H. J. BURKILL, Minuting Secretary.*

ENTOMOLOGICAL SOCIETY OF HAMPSHIRE AND THE ISLE OF WIGHT.—From small beginnings as the Southampton and District Entomological Society the above-named Society has grown. The change was formally made at a meeting held on *October 1st, 1921*, with the President, Mr. W. Fassnidge, M.A., in the Chair. With its now well-defined, if artificial, boundaries the Society should be able to make rapid progress with some of the objects it has in view. Prominent among the activities it now has in hand is the compilation of a county insect fauna list. Meetings will be held for the present, as formerly, at 47, Tennyson Road, Southampton, on the first Saturday afternoon in each month. Other meetings will be arranged in the future to be held from time to time in the larger towns of the county. An invitation is extended to every keen entomologist in the county to join the Society. Communications should be addressed to the *Hon. Sec.*, FREDK. J. KILLINGTON, 1, St. Catherine's Road, Eastleigh.

OBITUARY.

READERS of the 'Entomologist' will join in the great regret that all who knew him will feel in the passing away of Francis George Whittle, which took place on October 26th.

His end was tragic, but it was one which probably he—and for the matter of that many of us—would wish for, without pain, and apparently without premonition. He had taken his usual daily stroll along the sea front near his residence at Southend-on-Sea, with his fox terrier, to which he was much attached, and was found on a seat quite dead, the cause was heart failure. His faithful companion guarded all that remained of him, and it was an hour before the police could overcome its resistance. He had visited his friend the Rev. C. R. N. Burrows two days before his death, and was then apparently in his usual health and spirits.

Mr. Whittle was born at Highbury on August 31st, 1854, and would thus be in the sixty-eighth year of his age. For many years he occupied an important position in the Joint Stock Bank, retiring on a pension in 1913. Shortly after his retirement he went for a tour round the world, and was in Australia when the Great War broke out. His journey home was an exciting one, for the "Emden" was about, and the vessel he travelled in had to cross the zone of her activities; fortunately for him the German raider was avoided.

The subject of this notice was essentially a field naturalist, and few knew the habits and life-history of British Lepidoptera better, especially those of the Tineina, in which he specialised. From his long residence at Southend he probably knew more than anyone the many interesting species of Micro-lepidoptera frequenting the Thames marshes. One of his specialities was the extremely interesting psychid *Whittleia retiella*, of which he practically worked out the life-history. The generic name given by the late J. W. Tutt is, of course, in memory of him. Apart from his field work there are many notes in this and other magazines—principally accounts of his excursions or captures.

The summers of the last five or six years have been spent in the Scottish highlands, where he made many interesting captures, including a tortrix new to Britain *Ancylis tineana*, Hüb. (see 'Entom.', vol. liii, p. 12). The way he "stuck it" in those regions through the most appalling weather, and with the most primitive conditions of food and accommodation, from March to October, was eminently characteristic of the patient, determined, good-tempered, kindly nature of the man. He was the writer's companion for several happy and unforgettable weeks in West Sutherlandshire during the past summer.

Whittle was one of the most unassuming and diffident men the writer ever met, but when one got within the skin of the outer reserve, there was no one more generous, genial, or kindly natured. The following little incident will illustrate these qualities. Some time back he paid a week-end visit, and in running through my collections we discussed two species, of neither of which I possessed type. *Spilodes palealis*, formerly met with in the Southend district, and the very difficult to obtain *Catoptria nimbaria*. Shortly after-

wards there came a box from him containing four beautiful *palealis*, and a very good *nimbana*. A few weeks passed and I spent a weekend with my friend, and found that there was a blank in his series of *palealis*, and in the place of the specimens until recently filling that blank there were *four pinholes in the paper!* Turning to the *nimbana* series I found it consisted of two specimens and immediately below those was a *pinhole!* One will never forget, too, his kindness at the famous collecting locality of Camghouran on the shores of Loch Rannoch in 1919, and especially the way in which he turned out of his room and moved into a much inferior one, so that his guest might have the best accommodation the small cottage he was staying in afforded.

It is understood that his extensive collections are bequeathed to the British Museum (Natural History), which should greatly benefit thereby, for all his specimens are accurately and fully labelled.

W. G. S.

WITH deep regret we have to record the death of Albert Bridges Farn, which took place at his residence at Ganarew, Monmouthshire, on October 31st last, in his eighty-first year, being born on March 19th, 1841. For some years his health had been failing, and finally an operation was found necessary, which was performed successfully in August. That gave him hopes of being cured, but to his intense disappointment he learnt the following day that it was only a preliminary operation, and that a more serious one would be compulsory at some future date, which never occurred. In his weak condition this must have been a great trial during his last few weeks of patient suffering. In his last letter to the writer, dated September 4th, 1921, conveying this sad state of events, he adds: "Of course I have done no collecting this season. To-day is a most glorious one, not a cloud to be seen and the sun intensely hot, many *Io*, two *Atalanta* and one *Urticæ* (the only one I have seen this season) in the garden, besides the third brood of *Egeria*. . . ." Mr. Farn was not only one of the most learned students of British Entomology, but an accomplished all-round naturalist and a keen sportsman. As is well known to many readers of this journal, he specialised in British Lepidoptera, and during his long and vigorous life he formed the finest private collection of these insects in the country, surpassing that of the well-known collection formed by the late Sydney Webb. The Farn Collection is especially rich in the large number of remarkable varieties, and includes long series of many of our rarest species. He was a frequent attendant at the most important sales of British Lepidoptera held at Stevens' auction rooms, and at the death of Mr. E. Sabine in 1906 he acquired his entire collection, which was in itself an extensive one and contained a great number of fine varieties, including a wonderful lengthy series of *C. phœas*. The series of *C. dispar* is probably one of the finest in private collections, both as regards condition and the number of specimens (about 3 doz.), and includes one female, probably the largest example known. Among the extraordinary varieties, too numerous to mention, allusion must be made to the remarkable unique melanic *M. galatea* captured near Rochester in 1871.

Mr. Farn was not only a patient and keen observer, but a persevering and very successful collector. He was a frequent contributor to the 'Entomologist.' His first contribution appeared in the April number of vol. iv, for 1869, on "Critical Notes on Entomological Authors," occupying four and a half pages, in which he accurately alluded to the errors "in such books as Prof Westwood's 'Butterflies of Great Britain' and Mr. Stainton's 'Manual of British Butterflies and Moths'." In June of the following year he contributed five pages on the "Silk Culture of Japan," followed by numerous contributions on various subjects, and records of the capture of rare and interesting species during subsequent years. In 1880 he revised and extended the third edition of the well-known 'Insect Hunter's Companion,' by the late Rev. Joseph Green.

Besides an entomologist Mr. Farn was a well-known ornithologist and recognised as a very first class shot, consequently he was a frequent guest at the big shoots of the late Lord Walsingham and other noted shots. As a snipe shot he has probably not been equalled, his record bag being thirty snipe in thirty consecutive shots. He was an expert in taxidermy and accumulated a choice collection of many of our rarer birds, obtained with his own gun, and admirably preserved in natural attitudes as observed by himself in life. He also formed a very extensive and valuable collection of eggs of all the British birds, including the rarest waders and other Arctic breeding species. During his later years he devoted much of his leisure in making faithful coloured drawings of a great number of eggs in his collection—a task he found at times somewhat difficult, and which the writer had the pleasure of assisting him to accomplish. Upon his retirement from official duties at Whitehall, where he held the important post of Examiner and Administrator of Vaccine, about twenty years ago, he moved from his rural home at Greenhithe to Hereford, chiefly with the hopes of turning up in some of its old localities the now supposed extinct (in Britain) *L. acis*, but without success. While residing there and giving up the more fatiguing sport of shooting he became a keen angler, and landed many fine Wye salmon. From Hereford he moved still further westwards, to Ganarew, in Monmouthshire, where he did a large amount of natural history research in spite of his flagging health. Mr. Farn was a man of extraordinary courage, determination and reliability; his word was the acme of accuracy and truth. His loss will be keenly felt by a large circle of friends, and by none more deeply than by the writer of these lines, after a friendship extending over forty years.

F. W. F.





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